

# Chemical Week

October 2, 1954

Price 35 cents



- **Japan's Kato:** His firm typifies new Nipponese bid for world chemical markets . . . . . p. 26

**Here's how district** and home-office sales managers benefited from six-week job swap . . . . . p. 44



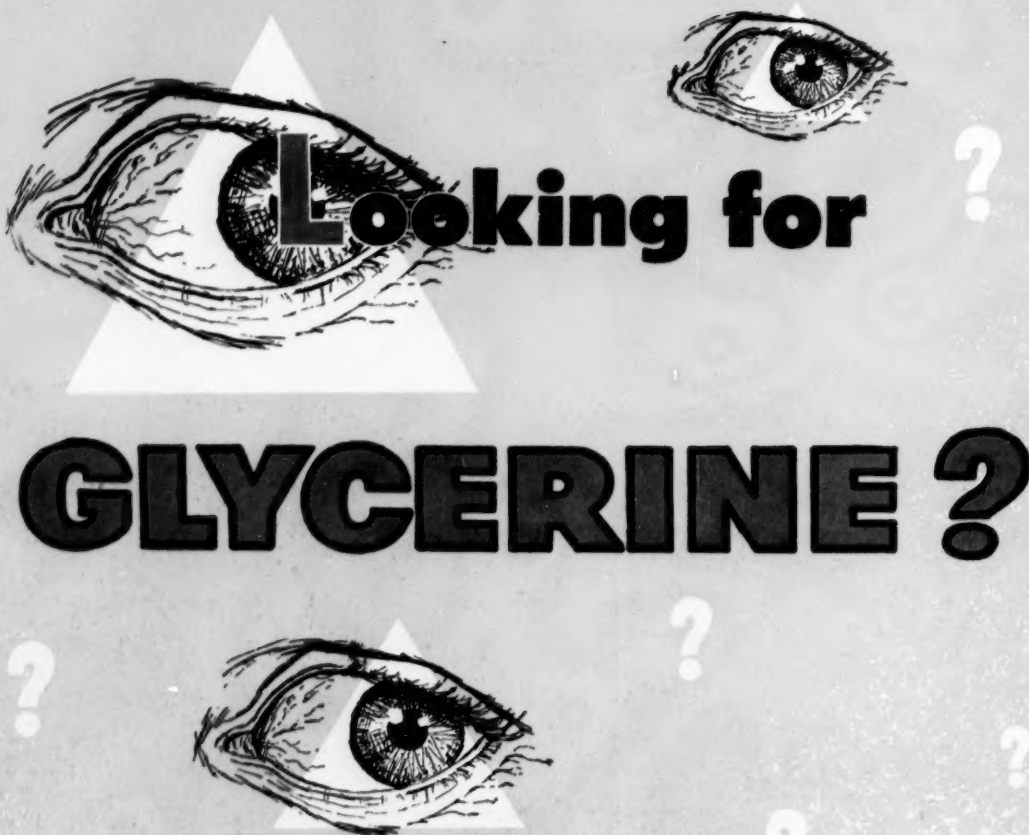
- **Dewey and Almy's Egan** counters a trend, makes a case for more chemists, fewer technicians . . p. 58

**Sanitizing with silver** has been oversold, but don't sell it short; it's making headway . . . p. 74



- **Carbide's Duggan:** His pennies for prevention save dollars in fire insurance and

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E-P POWER



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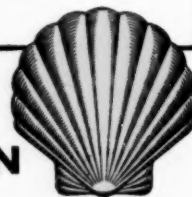
Your Shell Chemical representative will gladly give you the specifications of this high-quality glycerine.

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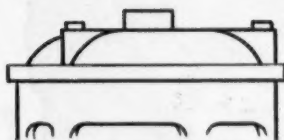
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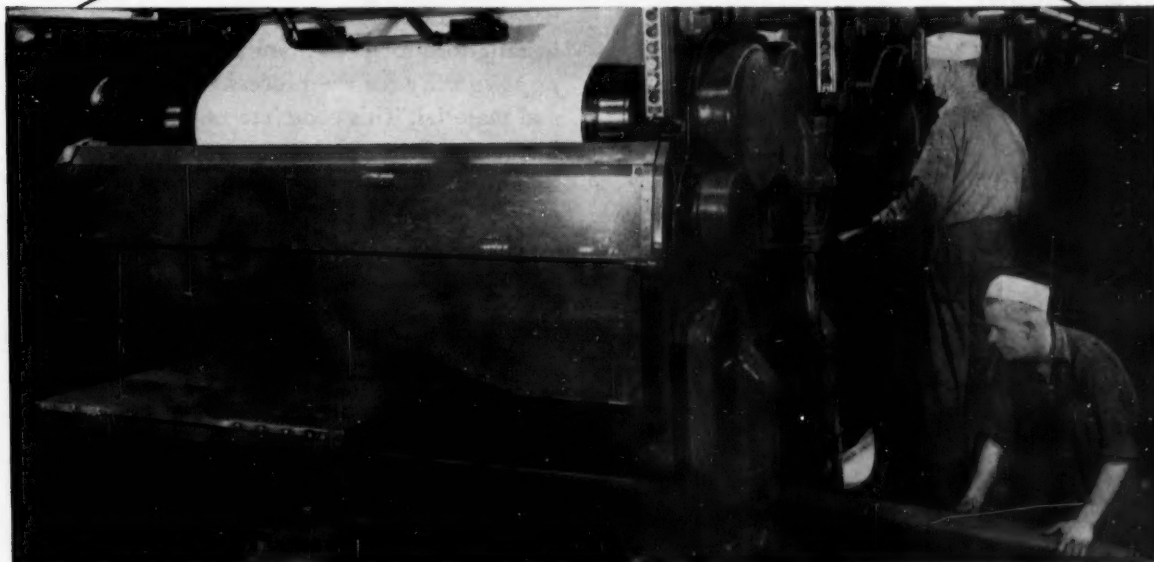
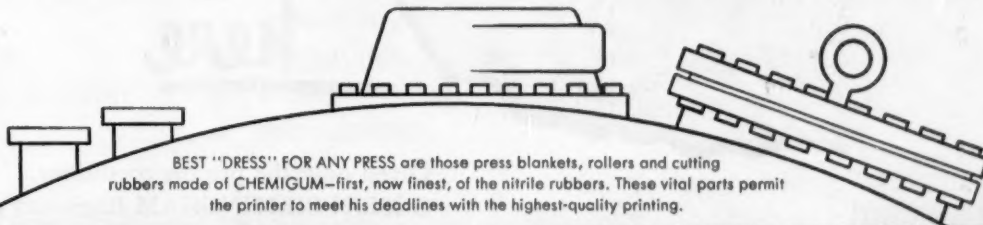






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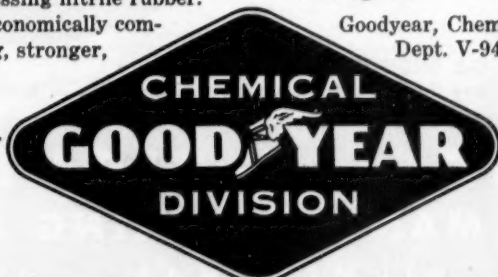
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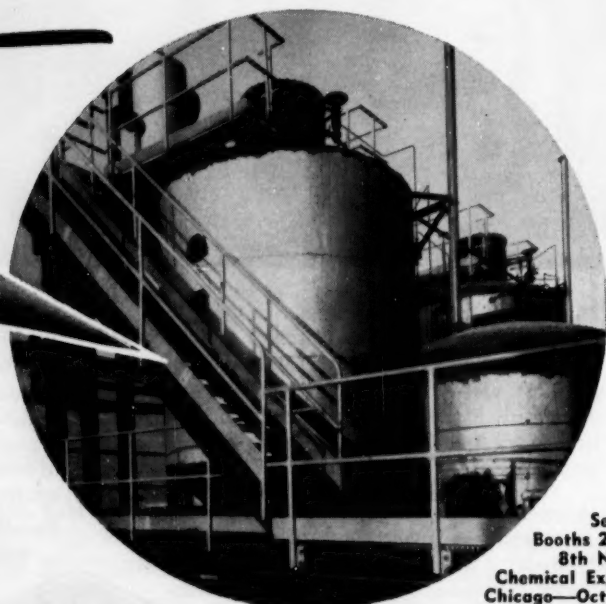
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# Chemical Week

Volume 75

October 2, 1954

Number 14

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October 2, 1954 • Chemical Week



## CORROSION RESISTANCE calls for QO FURFURYL ALCOHOL

Resins prepared from furfuryl alcohol are resistant to attack by acids, alkalis, and organic liquids. In addition, these resins have high heat resistance and low porosity. More and more industries are using furfuryl alcohol resins as the basis for mortars employed in the construction of floors, pickling tanks, sewers, smokestacks, digesters and reactors. Furfuryl alcohol based resins also serve as binders for glass fabric or asbestos reinforced pipe and duct, and in reinforced tanks and laboratory table tops.

If you have problems in which the answer is the use of a corrosion or chemical resistant material then investigate furfuryl alcohol and furfuryl alcohol resins. The Quaker Oats Company does not manufacture furfuryl alcohol resins but does supply furfuryl alcohol itself, and will be glad to refer you to the sources of supply for the resin. Write for a copy of Bulletin 205 which describes the chemical and physical properties as well as the use of this important chemical material.

## The Quaker Oats Company



### CHEMICALS DEPARTMENT

334L The Merchandise Mart,  
 Chicago 54, Illinois  
 Room 534L, 120 Wall St.,  
 New York 5, N. Y.  
 Room 434L, P. O. Box 4376,  
 Portland 8, Oregon

In Europe: Quaker Oats-Granproducten N.V.,  
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 Will, Paris IX, France

In Australia: Swift & Company, Pty., Ltd.,  
 Sydney

In Japan: F. Kanomatsu & Co., Ltd., Tokyo



# 1953



## SCORES OF FILTERS

including Oliver Chemical and Metallurgical Filters; Sweetland Pressure Filters, Oliver-Campbell Cane Mud Filters, Oliver Horizontal Filters, Oliver Precoat Filters and American Disc Type Filters. It's interesting to note that in some cases these shipments required several months to reach their destination. One cargo went through five transshipments.

These filters cover only those manufactured in the States at our Hazleton and Oakland factories. Several times this number were manufactured during 1953 in other countries, by our world-wide sales and manufacturing representatives.

## FOR HANDLING

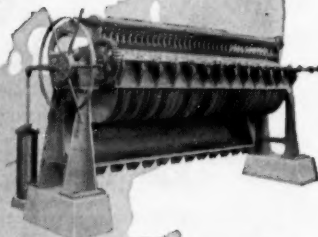
such products as tin, nickel, aluminum, zinc, uranium and copper concentrates; foundry sand, paper pulp, cane sugar mud, beet sugar carbonates, petroleum products, phosphoric acid, flue dust, pickling liquor, streptomycin, rice bran, volcanic sulphur, titanium solutions.

## IN THE FOLLOWING 20 COUNTRIES:

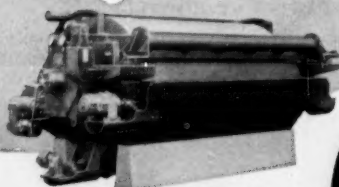
Argentina  
Australia  
Barbados  
Brazil  
Belgium  
Canada  
Chile

Cuba  
Germany  
Hawaii  
India  
Jamaica  
Japan  
Mexico

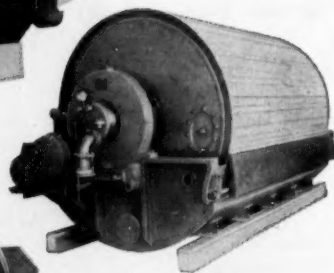
Panama  
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Peru  
Puerto Rico  
South Africa  
Venezuela



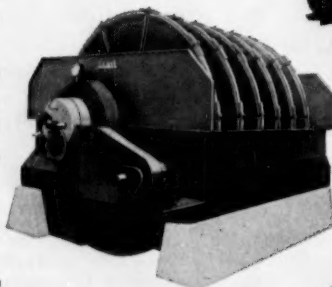
Sweetland Pressure Filter



Oliver Precoat Filter



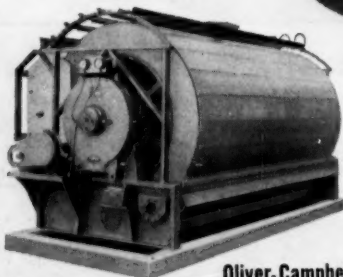
Oliver Continuous Vacuum Filter



American Continuous Vacuum Filter



Oliver Horizontal Filter



Oliver-Campbell Cane Mud Filter



# EXPORT SALES

## COULD WELL BE YOUR BEST GUIDE IN PLANNING 1954-1955 FILTER PURCHASES

This little 1953 export sales item provides some measure of the high regard in which Oliver United is held throughout the processing world. It's a high regard based on broad knowledge of filtration, wide selectivity of filter types, and world wide service.

Four vitally important requirements entered into all of these purchases. Bearing in mind that the filters were destined for operation thousands of miles from the place of manufacture, you can readily appreciate:

- 1** that the filters had to be the right type for the job to be done.
- 2** that they had to assure satisfactory performance.
- 3** that they had to be durable.
- 4** that they had to be backed by competent servicing.

*Can you afford to consider lesser equipment and lesser service when you come to place your 1954-1955 filter order?*

When you write or call for further information on Oliver United equipment, we suggest that you outline your filtration, washing or dewatering problem. It will help to expedite matters, if timing is an important factor.

*Write or call our main office for bulletins you want.*

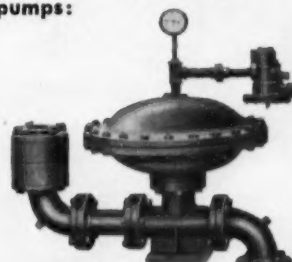
WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

# OLIVER UNITED FILTERS

NEW YORK 36—33 West 42nd Street • CHICAGO 1—221 North LaSalle Street  
OAKLAND 1—2900 Glascok Street • SAN FRANCISCO 11—260 California Street  
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### WHICH OF THESE PUMPS CAN HELP YOU?

We can offer a choice of three distinctly different pumps:



**ODS SLURRY-HANDLING**  
A Diaphragm Pump  
(Bulletin 309-R)



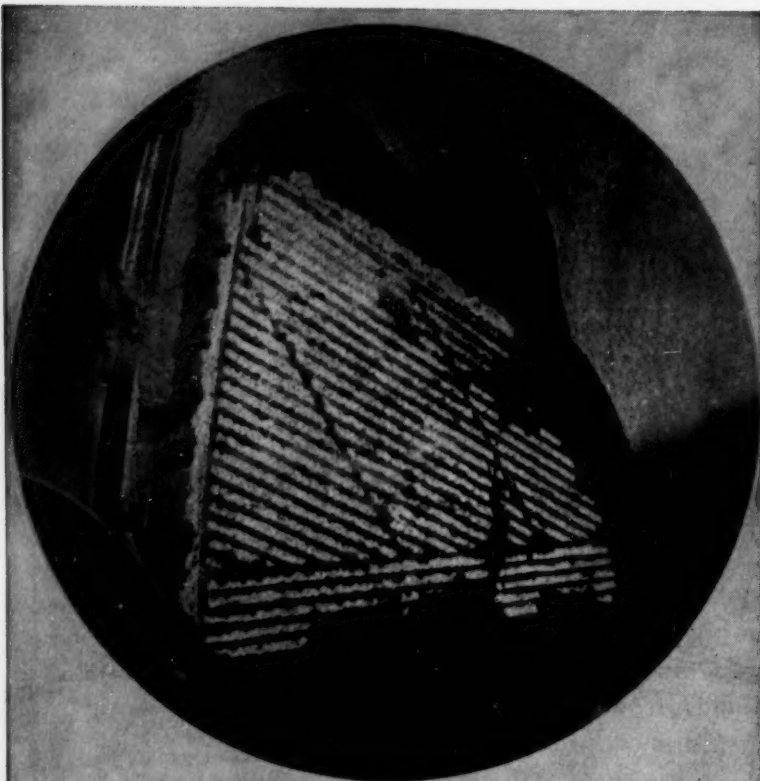
**OLIVER STAINLESS STEEL**  
A Centrifugal Pump  
(Bulletin 310-T)



**OLIVITE ACID-HANDLING**  
A Centrifugal Pump  
(Bulletin 308-R2)



FACTORIES:  
Hazleton, Pa.  
Oakland, Calif



## Better Cakes on Eimco Filters

Filter cakes with uniformity in thickness and dryness are formed best on Eimco filtration equipment.

When filters are required for any specific process to do a specific job, Eimco, with more than half a century of service to the process industries, is the logical firm to solve the problem and build the equipment.

Eimco builds the most complete line of filtration equipment offered by any manufacturer in the field. Eimco operates the only Research and Development Center for liquid-solids separation work exclusively. Many projects are in work for customers and much other research work is carried on which will require new types of equipment and that will be offered to the field with a complete background available only through Eimco.

We invite you to take advantage of the years of experience and "know-how" available at Eimco. Many problems in your process may have a similarity to problems we have already solved. Write for more information.



### THE EIMCO CORPORATION

Salt Lake City, Utah, U.S.A.

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*You Can't Beat An Eimco*

## OPINION. . . .

### Add Two to Ohio

TO THE EDITOR: I was very much interested in reading your article in the Sept. 4 issue, titled "Choicest Customers, Nearest Neighbors."

Of the 50 companies listed as occupying the Southern shores of the Lake Erie area, you inadvertently forgot, I believe, to include the coke and coal chemical plant of the American Steel & Wire Co., at Cleveland, and the similar plant of the National Tube Co., at Lorain, O., both plants being subsidiaries of the U. S. Steel Corp.

As you know, they produce large quantities of coal chemicals such as benzene, toluene, xylene, naphthalene and others.

This omission is all the more important since, in the same issue, on p. 77, you dwelt on the steel industry's by-product coke ovens, stating that they were "hefty chemical producers."

Please consider the above comments, not as being critical but rather as informative.

JOHN V. FREEMAN  
New York, N.Y.

*You're right, Reader Freeman. The corporate names of these two firms diverted our attention from their chemical activities. Still, you must admit, 50 out of 52 is a respectable .962 batting average.—ED.*

### Sponsored by GAF

TO THE EDITOR: . . . Your news article "Working off the Fat" (Aug. 14) was a most interesting summary of the present tallow situation . . .

You mention the work being done by the Eastern Regional Research Laboratory on vinyl ester syntheses . . . I think you might like to know that the synthesis you describe for vinyl stearate was actually developed by General Aniline as part of a rather extensive research project under contract with the ERRL . . .

JESSE WERNER  
Director, Commercial Development.  
General Aniline & Film Corp.  
New York, N.Y.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

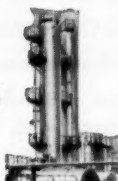
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W. A. Jordan, Chemical Week, 330  
W. 42nd St., New York 36, N. Y.

# New **GRAVER** Edge Moor Plant

...occupying 25 acres  
at Edge Moor, Delaware  
(adjacent to Wilmington)  
for the manufacture



of towers



pressure vessels

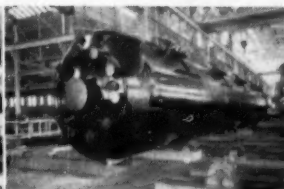


...eastern headquarters for



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and exclusive **GRAVER** conservation designs



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**GRAVER**

...tank fabricators for 97 years

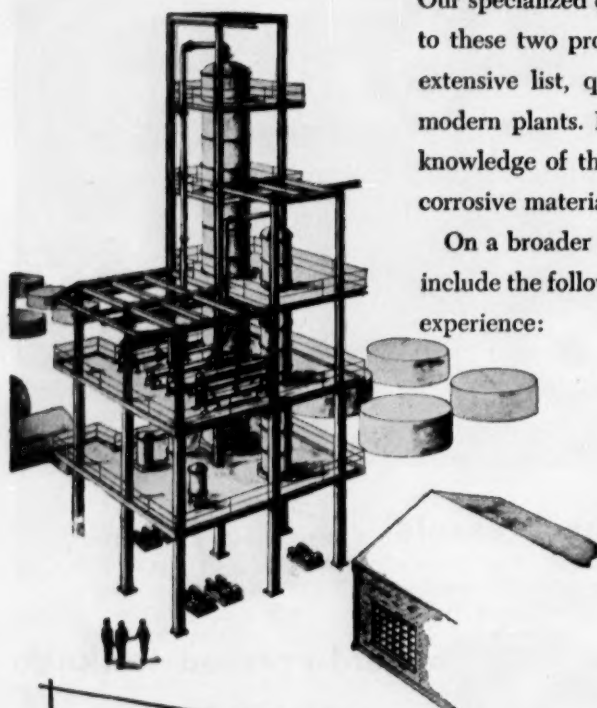
# 2 *Current Projects of Interest*

## ● Catalytic Polymerization

## ● Secondary Butyl Alcohol Synthesis

Our specialized experience with the chemical problems peculiar to these two projects, which have been selected from a rather extensive list, qualified us to design and construct these two modern plants. In particular, these processes require a special knowledge of the chemical reactions involved, the handling of corrosive materials and product separation.

On a broader scale our engineering and construction services include the following, in each of which we have had considerable experience:



Organic Chemical Synthesis

Inorganic Chemical Processing

Catalytic Operations

Solvent Purification

Separation and Refining of Organic Chemical Mixtures  
by conventional, azeotropic and extractive  
distillation, liquid-liquid extraction, crystallization

Petroleum Processing:

Topping and Vacuum Distillation

Lube Oil Units

Coal Tar Distillation

Gas and Vapor Recovery

Pharmaceuticals

*If you have any plans involving a new plant or unit, expansion or modernization, we shall be glad to discuss them and outline our methods of procedure.*

# Engineering

Design and Construction  
of Process Plants

●  
Design and Construction  
of Process Units

●  
Process Evaluations

●  
Economic Studies

## BADGER MANUFACTURING COMPANY

230 BENT STREET, CAMBRIDGE 41, MASS. • 60 EAST 42nd STREET, NEW YORK 17, N. Y.



## OPINION . . . . .

### Chemicals to Be Screened

TO THE EDITOR: . . . That was a good news article you published on the institute's division of experimental chemotherapy ("New Hope in Chemicals", July 24, p. 74) . . . and I thought you might like to know that it already has had the good effect of bringing our work to the attention of a number of chemical and pharmaceutical houses with which we had previously had no contact.

Therefore your report will result in our obtaining additional compounds we might not have otherwise received.

C. CHESTER STOCK  
Chief

Division of  
Experimental Chemotherapy  
Sloan-Kettering Institute for  
Cancer Research  
New York, N. Y.

## DATES AHEAD

**Commercial Chemical Development Assn.**, fall outing-meeting, Bedford Springs hotel, Bedford Springs, Pa., Oct. 7-8.

**American Oil Chemists' Society**, fall meeting, Radisson hotel, Minneapolis, Oct. 11-13.

**National Chemical Exposition**, Chicago Coliseum, Chicago, Oct. 12-15.

**National Safety Congress and Exposition**, chemical section, Chicago, Oct. 18-21.

**Packaging Institute**, annual forum, Roosevelt hotel, New York, Oct. 25-27.

**Assn. of Consulting Chemists and Chemical Engineers**, annual meeting and symposium, Belmont Plaza hotel, New York, Oct. 26.

**Plastics in Building Conference**, sponsored by the Society of the Plastics Industry, the Manufacturing Chemists' Assn., and the Building Research Advisory Board, National Academy of Sciences, Washington, D.C., Oct. 27-28.


**Air Pollution Control Assn.**, semi-annual technical conference, Biltmore hotel, Los Angeles, Nov. 4-6.

**National Paint, Varnish and Lacquer Assn.**, annual meeting, Palmer House, Chicago, Nov. 15-17.

**National Foreign Trade Council**, annual convention, Waldorf-Astoria hotel, New York, Nov. 15-17.

**Magnesium Assn.**, annual meeting, Chase hotel, St. Louis, Nov. 15-17.

**Federation of Paint and Varnish Production Clubs**, annual meeting, Palmer House, Chicago, Nov. 18-20.



# POWER

## STABILIZERS FOR RIGIDS

**ADVASTAB 17-M (liquid)** (organo-tin sulfur compound)  
Most powerful of organic stabilizers.

**ADVASTAB P-1835** (organo-tin compound) Most effective  
organo-tin stabilizer with lowest toxicity of any tin stabilizer known at present.

**ADVASTAB T-72** (non-mercaptide organo-tin compound)  
Powerful organo-tin stabilizer with very low toxicity. Gives minimum odor and irritating fumes during processing.

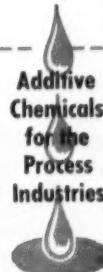
Non-tin Stabilizers also are available for rigid compounding

Advance makes a complete line of stabilizers for Rigids, Calendering and Extruding, Plastisols and Organosols. These products as well as Paint Driers, and Paint Specialty Chemicals (another industry where Advance is recognized as the pioneer source) are products of the Advance Research Laboratories — dedicated always to develop better and better

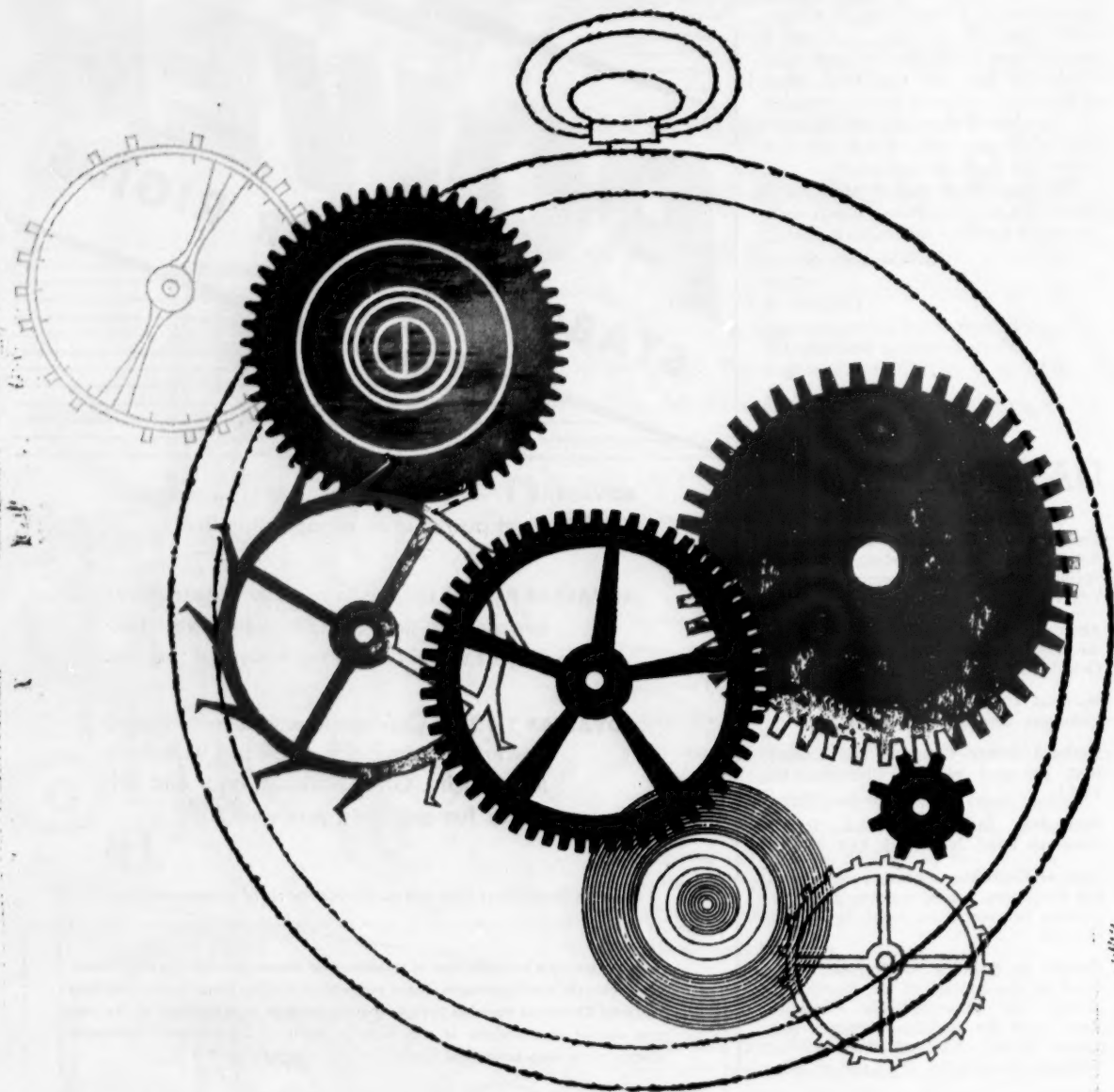
# ADVANCE

Solvents and Chemical Corp.

245 Fifth Avenue, New York 16, N.Y.



**to men buying more chemicals than ever before:**



2873

caustic soda • soda ash • chlorine • sulphuric acid • sulphur • ammonia • nitrate of soda • bicarbonate of soda • nitric acid • sulphate of alumina • sodium chlorite products • ethylene oxide • ethylene glycol • diethylene glycol • triethylene glycol • polyglycols • dichloroethylether • ethylene dichloride • methanol • sodium methylate • ethylene diamine • hexamine



## WHAT MAKES A CHEMICAL PRODUCER **TICK?**

To be of greatest advantage to you, a chemical manufacturer should enjoy a close association with an ever-increasing number of diverse chemical consumers. At Olin Mathieson, this contact keeps production geared to current and anticipated requirements . . . keeps technology abreast of the latest developments . . . provides a direct link with many other important industries that can broaden your trade relations.

Production strength and flexibility second to none is provided by a score of plants in key industrial areas. Today, Olin Mathieson ships *chlorine* from five plants . . . *sulphuric acid* from seven . . . *caustic soda* from six . . . *ammonia* from three . . . *soda ash* from two. A modern *petrochemicals* plant supplies important ethylene-based chemicals and derivatives. *Chemical specialties* are produced for dairies, laundries, water and sewage

treatment, paper and textile processing, and foundry applications.

A unique background of research and production experience is available to you through Olin Mathieson. Experts in cellulose chemistry, arms, ammunition and explosives are provided by the Olin merger . . . acquisitions have furnished similar facilities for anti-freeze and automotive chemicals research . . . also notable experience in fuels, metallurgy, and ceramics applied to rocket technology. Close contact with developments in the traditional chemical consuming industries has always been maintained.

With more industries buying more chemicals, an association with an alert, aggressive chemical producer is more important than ever before. Our executive office will be very glad to put you in touch with the men who can best serve your interests.

### OLIN MATHIESON CHEMICAL CORPORATION



#### INDUSTRIAL CHEMICALS DIVISION

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MATHIESON

ATLANTA 2, Georgia, 225 Chester Ave., S. E.

BUFFALO 3, New York, Rand Building

CHARLOTTE 2, N. C., Liberty Life Bldg.

CHICAGO 11, Illinois, 400 N. Michigan Ave.

CINCINNATI 2, Ohio, Dixie Terminal Bldg.

HOUSTON 2, Texas, Gulf Building

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PHILADELPHIA 7, Pa., Lincoln-Liberty Bldg.

PROVIDENCE 3, R. I., Hospital Trust Building

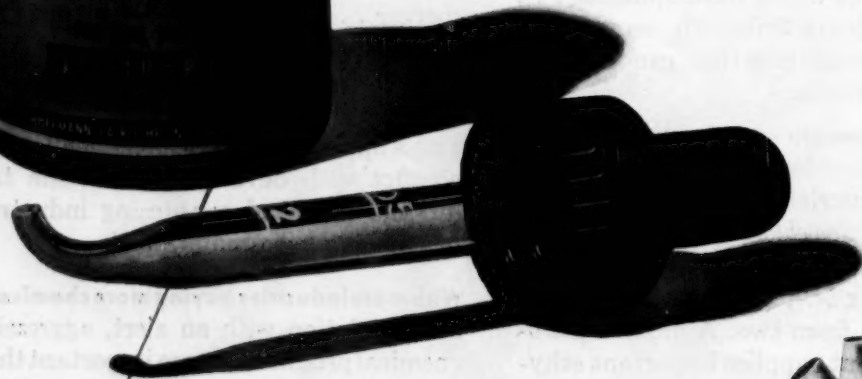
ST. LOUIS 2, Missouri, Rialto Bldg.

*since 1931*

# *Glycerine* *is the* *Stabilizer*



Because of its many advantages in the treatment of certain cardiac disorders, Digalen 'Roche' has been a valuable asset to clinicians throughout the world since its introduction in 1931. Rigid control measures are used in the manufacture of Digalen to assure unvarying composition. Its 33% Glycerine content provides stabilizing action, and in a product of this type stability is absolutely essential.



The nature of the ingredients in many pharmaceutical preparations is such that they require a stabilizer to maintain their effectiveness. Glycerine is frequently chosen to do this job, not only because it is an excellent stabilizer, but also because it can provide many other properties, too. Glycerine can act as a demulcent, solvent, suspending agent, humectant, or preservative.

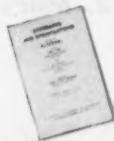
Glycerine is nontoxic, and has a pleasant taste. No other product comes even close to matching Glycerine's unusual combination of properties.

## **TECHNICAL DATA**

which you should have



20-page booklet on  
Glycerine for product  
conditioning



12-page booklet on  
Glycerine standards  
and specifications



16-page booklet on  
Glycerine properties  
and applications

For your free copy of any or all of these booklets, write  
Glycerine Producers' Association, 295 Madison Avenue, New York 17, N. Y.

*Nothing takes the place of Glycerine*





RESULTS OF AN INTELLECTUAL REVOLUTION . . .

## **"The Western Miracle" Continues . . . More Automatic Controls for Industry**

**W**ithin recent weeks three new monthly technical magazines devoted to automatic control systems for industrial processes and machinery have offered the public their first issues. One of these is **CONTROL ENGINEERING**, a McGraw-Hill publication.

What has caused this surge of interest in the design and application of automatic control systems? What does it portend for the future of American industry? More important, what does it promise for the American standard of living, of which industry is and must be the servant? And what is the role of **CONTROL ENGINEERING** in this development? It is to those questions that this statement is addressed.

### **A New Intellectual Revolution**

It is frequently asserted that we are now in the throes of a new industrial revolution. The revolution is described as the eliminating of wasteful applications of human labor to repetitive tasks through new technology which makes it possible to transfer those tasks to automatically controlled machinery.

It is perhaps more accurate, however, to say that we are the beneficiaries of a new intellectual revolution in the application of science to industry. This new intellectual revolution points the way toward giant strides in the continuing proc-

ess of taking dull and laborious work off the backs and minds of men and transferring it to machines operating in large batteries under automatic control.

The practical engineering work required to convert this intellectual revolution into a full-scale industrial revolution, however, in large part still remains to be done. It is to this task that **CONTROL ENGINEERING** will be devoted. Its role is that of bridging the gap, in engineering and economic terms, between the new conceptions of automatic control of industrial processes and their practical workaday application. These conceptions run the full gamut from systems of control for automatic factories making heavy industrial products to highly personalized systems of automatic control to warn people when they are approaching the broiling point in sunning themselves at the beach or becoming too drowsy to drive their cars safely.

### **Enter the "Feed-Back" System**

Enough work has been done to move these conceptions out of the realm of interesting dreams and into the realm of practical possibilities, and in some cases into the realm of practical realities. Crucial parts of this work were done during World War II when weapons were successfully equipped with "feed-back" systems

that automatically corrected mistakes made by the weapons in locating their targets.

The principle of the "feed-back" system is as ancient as the personal monitor that tells us not to run into each other as we walk along the street. It feeds back to our locomotion machinery the warning of a collision ahead. But the application of the principle to weapon control and then to more general machinery control required superlatively imaginative and skillful scientific development.

When a "feed-back" system that monitors an automatic process and keeps it lined up precisely is teamed up with a computing machine, capable of making lightning calculations that control both what goes into the process and what is done with the product, the horizons of automatic control become broad indeed. But in large part they still remain horizons. A vast range of practical engineering work remains to be done to realize anything like the full potential of automatic control of industrial processes and machinery.

### More and Better Jobs

There are those who view the surge of interest in automatic control with alarm. They conjure up a situation in which automatic processes will at once expand the ranks of the unemployed and reduce many of those still working in industry to the status of robots or automatons.

A look at the record of the American economy — a record of amazing growth, steadily improving job opportunities and a constantly rising standard of living — demolishes the basis for such fears. The introduction of new and more efficient industrial machinery and processes obviously cannot be accomplished without creating some disturbance for some individuals and some companies. But consistently the longer range effect of such local and temporary disturbance has been more jobs and better jobs for Americans.

It is no accident that, while the proportion of industrial wage earners in our population is virtually the same as it was in 1920, the pro-

portion of professional and salaried workers has doubled. The proportion of unskilled workers, furthermore, has dropped by half. This has been an essential part of a continuing process by which drudgery has been transferred to machines while the workers who formerly did the drudgery have been graduated to jobs calling for greater competence and providing better pay.

### Higher Living Standard

A British historian, H. J. Hancock, has referred to this general process as "the Western miracle"—that of providing an ever higher and higher standard of living for more and more Americans. The key element in this miracle has been more and more reliance on power-driven machines to get the day's work done.

In the nature of the extremely complicated apparatus involved, full development of systems which have passed through the "think stage" into the status of practical possibilities will be a time-consuming process. It will also be a very exacting process, calling for a tremendous application of engineering skill and ingenuity. However, the engineers who are concentrating on this difficult, workaday phase of the development of apparatus for automatic control will be inspired by the knowledge that they are making a crucial contribution to technical progress which holds great promise of good for the American people.

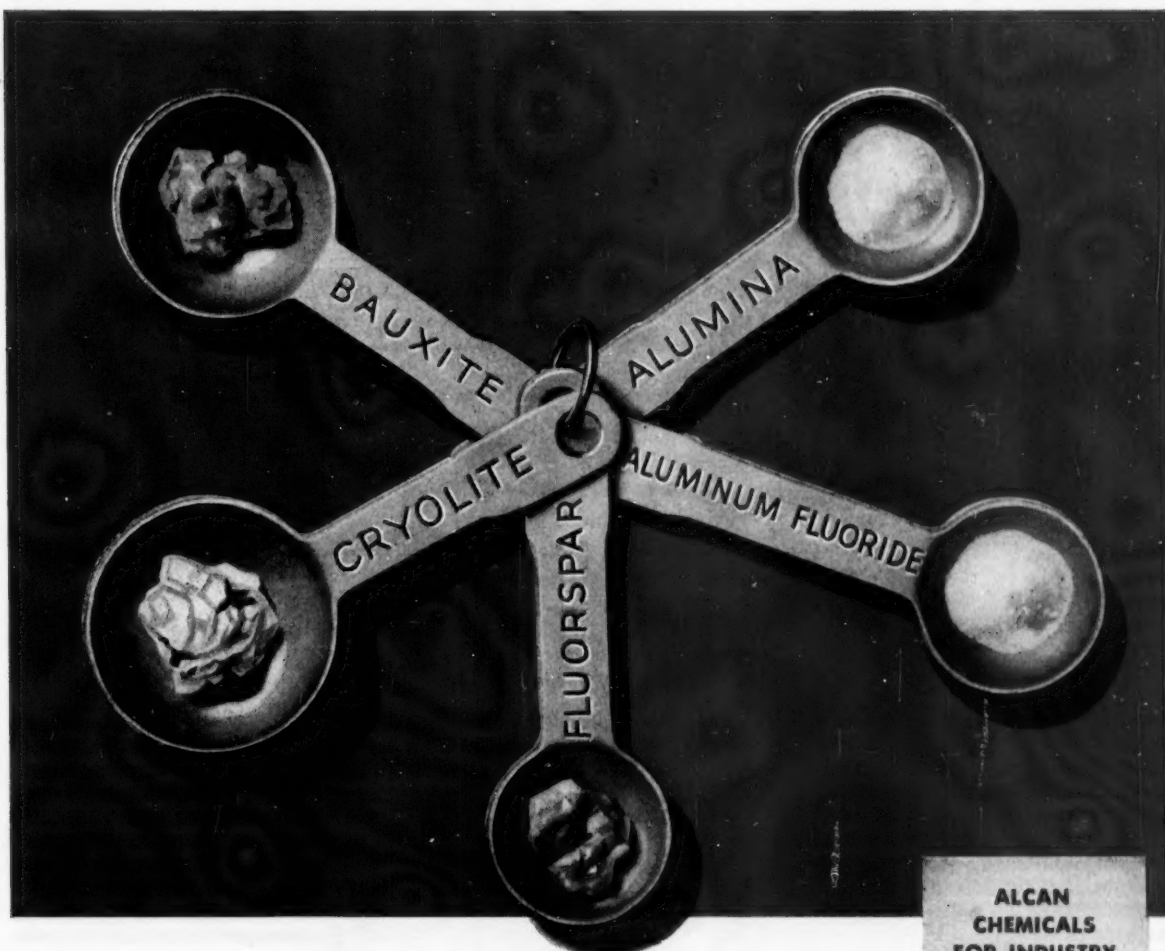
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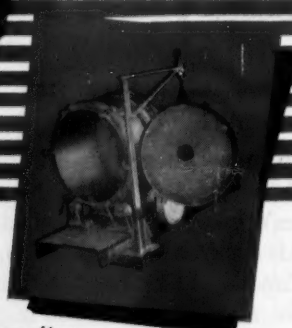
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## NEWSLETTER

One swallow doesn't make a summer, but the business curve has started climbing again if Hooker Electrochemical's latest report is any criterion from which to generalize.

Working on an odd fiscal year, Hooker is early with its "third-quarter" figures. Its three-month sales ending August 31 were 18% above last year's comparable quarter, and nine-month sales were up 17%. Earnings, too, were up 17% for the nine months.

That's the immediate picture; but the long-term view, according to Allied Chemical's Vice-President Harry Ferguson, is equally bright. He told a gathering of New York businessmen late last week that the chemical industry had grown tenfold in the last 40 years and that "the experience of the last 15 years far exceeded the most imaginative forecasts of an earlier day."

The outlook for the future, he continued, includes many promising developments, among which are atomic and solar energy, new techniques of processing coal, the vast possibilities of high-temperature chemistry, and petroleum—a "still largely unexplored treasure chest of building blocks for chemical synthesis."

Predicting an even faster rate of growth than during the past decade, Ferguson cited the industry's \$300 million/year research that brings into the market an average of one new product a day, pointed to metals, plastics, fibers, agricultural chemicals and medicinals as sectors most susceptible to growth through continued research.

Did the Federal Power Commission make a rule or set a rate when it froze natural gas prices? It makes a difference. Protesting the order in a day-long argument last week, independent gas producers contend that the action was illegal since it wasn't preceded by notice and a hearing; but FPC says it was a rule-making rather than a rate-making action and thus required no hearing. The producers further contend that the order (174-A) is unworkable in that it conflicts with various state gas conservation laws and doesn't define—precisely enough for legal purposes—such terms as "independent producer" and "interstate commerce."

Last week's arguments involved the petitions of more than 100 independents for a rehearing of the order.

The dispute grew out of the U. S. Supreme Court's ruling (*CW*, June 19, p. 40) in the Phillips Petroleum case that independent producers whose natural gas ends up in interstate pipelines are subject to FPC jurisdiction. The complaining lawyers say that the Phillips case was decided on a specific set of circumstances that shouldn't be used as a basis for general regulation of the industry.

Official word will go out sometime next week that the cotton cyanoethylation (*CW*, Aug. 21, p. 98) production unit built by American Cyanamid at Standard-Coosa-Thatcher's Rossville, Ga., plant is operating.

Output of the unit is slated for evaluation tests. The product is aimed primarily at nonapparel uses—tenting canvas and other outdoor

fabrics where the fiber's resistance to rot and microbial attack is of especial significance.

Institute of Textile Technology, Charlottesville, Va., which did the bulk of the basic research, is publicizing the development to its members—which account for about half the mills of the cotton industry.

•

The torrent of fluorinated hydrocarbon refrigerants and propellants flowing from the U. S. to Canada will soon slow to a trickle—if that. Du Pont Co. of Canada Ltd., the Du Pont segment of the old Canadian Industries Ltd., will build a Freon plant large enough to meet all Canadian requirements, now fulfilled largely by imports from the U. S. Too, it will use made-in-Canada raw materials to the fullest possible extent. It will be built at Maitland, Ont., adjacent to the nylon intermediates plant that went into production a year ago. Construction will begin immediately.

This is fast-moving Du Pont of Canada's second new project within a quarter-year: already under construction at Kingston, Ont., adjacent to its nylon spinning plant, is the first building of its new research center.

•

Another Canadian expansion is Shell of Canada's new construction at its Jumping Pound, Alta., natural gas and sulfur plant.

The multimillion-dollar additions will provide more gas for southern Alberta (capacity will be jumped from 35 to 60 million cu. ft./day), and sulfur-from-hydrogen sulfide capacity will be more than doubled (from 30 to 80 tons/day). Current output goes to Canada's West Coast pulp and paper industry; the additional production will be purchased by Gunnar Mines Ltd., converted into sulfuric acid for use in leaching uranium ores in the Lake Athabaska region.

•

Law enforcement officers last week were putting lots of teeth into their bite:

- In Hillside, N. J., Acting Magistrate Allen Tumarkin meted out what seems to be the severest penalty yet for alleged infraction of air pollution laws: \$600 fine and 180 days in jail for Charles W. Berghorn, Jr., manager of Mundet Cork Corp. Tumarkin says he made the sentence stiff because Berghorn and the corporation were each fined \$100 last June, and this is therefore alleged to be a second offense. Berghorn is free in custody of his attorney, pending appeal. Tumarkin computed the sentence on the basis of \$100 fine and 30 days in jail for each of the six violations charged.

- The Sarasota, Fla., city commission passed an "emergency" ordinance banning sale or use of parathion or other toxic organic phosphates within the city limits. Effective immediately—prior to a public hearing next week (Oct. 4), the ordinance stipulates that violation is a misdemeanor. Triggering the action were reports received by city commissioners that persons using the chemicals on lawns and gardens suffered ill effects.

- In Brunswick, Ga., Superior Court Judge Douglas F. Thomas signed two new court orders temporarily restraining Rayonier Corp. from dumping fish-poisoning wastes into the Altamaha River (*see p. 23*). The two new injunctions and the one already filed will be heard next week. The two new actions were filed by fishing clubs located on adjoining river-front properties about 20 miles downstream from Rayonier. One of them is also suing Rayonier for \$25,000 damages to its property.

... The Editors

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October 2, • Chemical Week

**HERCULES**

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Section of three U.S. Uscolite Pipes in color mixing section of wallpaper plant. The pipes carry corrosive solution for fixing the print on wallpaper.



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## BUSINESS &amp; INDUSTRY . . .

## Taking Off the Gloves

Despite all the controversy that has already been waged in past weeks between protectionists and free-traders over U.S. participation in the General Agreement on Tariffs and Trade, it looks this week as though the tug-of-war has just started.

And that means trouble's brewing for certain segments of the chemical industry that, because of their vulnerability to foreign competition, tariffs, and the future pattern of the U.S. reciprocal trade program, are vitally interested in the outcome of the struggle.

Taken chronologically, the battle in the weeks ahead should focus on two main scuffles:

- The next round of hearings (to be held Oct. 18) in Washington on special commodity problems arising out of GATT regulations.
- The Justice Dept.'s study (started by Attorney General Herbert Brownell) of protectionist charges that GATT itself is unconstitutional.

But the stakes involved are far more important than the individual skirmishes might indicate. The Eisenhower Administration has pledged itself to renegotiate GATT during its annual meeting in Geneva in November—to convert it into a permanent organization and submit U.S. membership recommendation to Congress for ratification. Success by the Administration in strengthening the tariff bargaining and trade rules machinery of GATT in any way would prove to be a major shot in the arm for reciprocal trade and could foreshadow continued (and progressive) lowering of U.S. tariff barriers.

If, on the other hand, GATT is weakened during the course of the negotiations, or Congress vetoes U.S. participation, the whole fabric of multilateral tariff concessions negotiated since the war (under which U.S. tariffs have dropped nearly 50%) would begin to unravel. New concessions also would be much harder to negotiate.

The new hearings scheduled for October will be concerned mainly with Article 28 of the GATT agreement. (This article originally provided that after three years had elapsed any country could withdraw tariff concessions unilaterally without the consent of



BROWNELL: Rechecking for legal loopholes in GATT.

other GATT members.) The government will try to get the U.S. trading community's views on whether Article 28 should be allowed to come into force now and, if not, whether any alternative mechanism should be set up to permit unilateral withdrawal of concessions. But in addition to general views, a number of individual industries will be invited to present their briefs for unilateral withdrawal of tariff concessions made on specific products.

That's where the real fireworks should come, because partisans of free trade are sure that implementation of Article 28 will lead to a chain reaction of tariff concession cancellations that in time could drive U.S. tariffs back to Smoot-Hawley levels.

In the second clash—over the Brownell move to look into the constitutionality of GATT—the fight should be equally heated. Chief argument of opponents of GATT has been that it is unconstitutional because Congress has no right to delegate its tariff-fixing powers to the Executive, and the Executive has even less right to delegate any control over tariffs to an international organization.

The Administration has contended that Congressional right to delegate implementation of its constitutional functions to the Executive has been thoroughly established in the courts,

and that the Administration has the further right to exercise the tariff-fixing authority delegated to it by Congress within the framework of an international organization.

The Administration now proposes to strengthen its legal position on the latter point by seeking explicit authority from Congress to participate in GATT. And the Justice Dept. has been asked to review the legal aspects of GATT (1) to make doubly sure of the soundness of the Administration's position, (2) to plug any legal loopholes that may exist in the GATT agreement, and (3) to gather legal ammunition for the fight for GATT in Congress next year.

Chemical companies will watch developments closely, convinced that at stake is "the durability and stability of postwar tariff concessions."

## More About Titanium

There's a second round of titanium expansion now in the offing—official word on which will be released sometime this fall. But no one's yet willing to predict how much the new goal will extend beyond the current 30,000-ton goal.\* Reason: a heavy defense stockpile objective could easily swell even the most enthusiastic guesses.

Creation of the second round is a switch from government plans tentatively made three months ago to hold the line on titanium at 30,000-odd tons until a continuous production process could be commercially proved. But Washington planners apparently now feel the government will have to commit itself to more batch-method expansion—sure indication that the government thinks continuous process production is still some time off.

In effect, the first-round expansion will be buttoned up next month when GSA signs its second market guarantee agreement with Du Pont. The new contract will call for construction of a \$30-million-plus plant in Tennessee with capacity of 7,500 tons.

GSA has five other titanium contracts currently under negotiation, 12 contract proposals "under preliminary study." And these would be the basis for the forthcoming second expansion go-round.

\* Firmed this week at 5,000 under last week's interim 35,000.



NOISEMAKERS: In a spirit of cooperation, CIO Chemical Workers embrace . . .

## Unanimity for Strength

Last week, midst wild cheers and showering confetti, the United Gas, Coke and Chemical Workers converged noisily on St. Louis' Jefferson hotel, debated for two days, and then passed (by a 667-192 vote) a proposal to join forces with the Oil Workers International. Their obvious intent: to combat merger-swelled chemical companies on "more equal" grounds—to match strength with strength.

Actually, the merger's not entirely official yet; it has to be approved by

the Oil Workers' convention in Cleveland in mid-November. But nobody doubts that they'll add their stamp of approval to the move. The only real opposition to the merger came from some officers of the Chemical Workers who feared that the new union would be dominated by oil workers. Oddly enough, however, two of the "rugged opposition" (Vice-President Buchanan and Secretary-Treasurer Martin) were elected to office and scored the big unexplained upset of the meeting.

**The Master's Touch:** There's no doubt that much of the credit for unified union opinion in St. Louis must be attributed to CIO President Walter Reuther. In a keynote speech to delegates, the CIO president struck out at the Administration's foreign policy and recent federal tax law revisions and then threatened to cut off the Chemical Workers from CIO funds and assistance if they were, as he plainly termed it, unwise enough to reject merger with the Oil Workers.

His reasons for merger of the unions were basically:

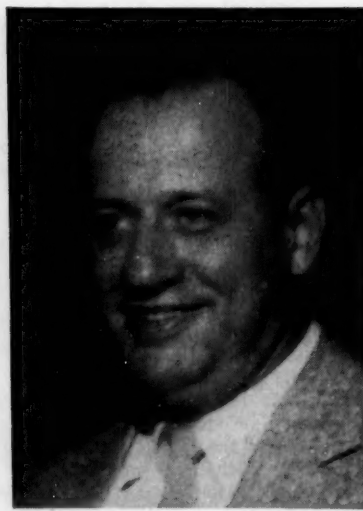
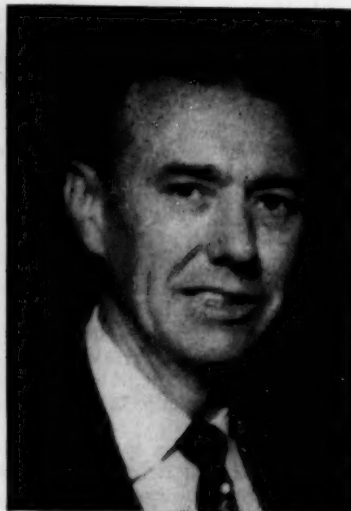
- Split forces and a "fringe approach" don't succeed in organizing an unorganized industry.

- There's no better way to accost key companies in oil and chemicals—Standard Oil Co. of New Jersey, Du Pont, and Union Carbide—than by a joint attack.

Reuther figures the membership potential of the new union—spanning both industries—could be as many as a million workers. He stresses that chemical and oil companies are expanding, are making "heavier" profits, can afford to pay more in wages since their annual wage cost is a much smaller percentage of total production than is industry's in general.

**No Easy Job:** But, as Reuther himself admits, petroleum refineries and chemical process plants are not going to be an easy push-over. Some of the very things about them that attract union strategists (high profits, relatively low labor costs) make them difficult to organize.

Companies like Du Pont and Jersey Standard, have strong independent unions accustomed to dealing with top



SWISHER, MARTIN, BUCHANAN: The former strongly for merger, the others against.

management in their own plants. And pay scales in both industries are among the highest in the country. It's a good bet therefore that company managements will tend to go along with any wage increases won by CIO-organized plants—deliberately giving independent unions a strong argument against any CIO blandishments.

Essentially, what Reuther and the leadership of the new union (to be called the Oil and Gas Workers International) will have to sell is "we can get you more." But that they will be able to won't be simple for them to prove.

**Wide Extremes:** What chemical companies will be watching most in the months ahead, however, is how militant the new union will turn out to be. Two extremes have been meshed. Elwood Swisher (re-elected to a second-two-year term as president) of the UGCCW has led his union through a relatively strike-free period. The oil workers, on the other hand, closed down 35% of the petroleum refineries in 1952 but they still weren't able to force their demands on management.

The new union's constitution will closely resemble the uncompromising code under which the oil workers operate. But chemical management is hoping that the influx of Swisher and his followers will prove to be a tempering factor. At the very least, they're convinced that this latest convert to the trend toward mergers will be an organization to watch.

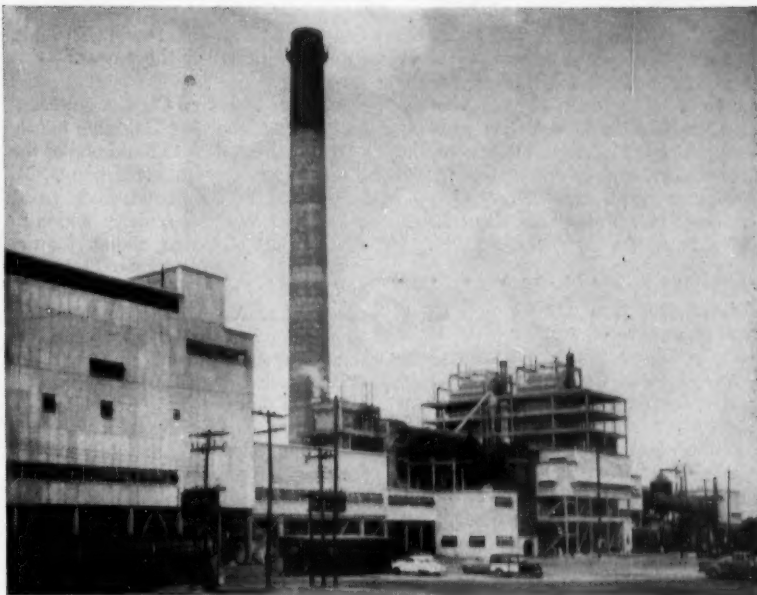
## Cooperation for Health

Under study by the Manufacturing Chemists' Assn. is the possibility of setting up an independent health research center (CW Newsletter, Sept. 25) to determine the effects of chemicals on people.

MCA is establishing a committee of chemical executives and technical men to consider such a center as well as other possible industry activities in the public health field.

Chief purpose of the proposed center: to correlate data resulting from the millions of dollars' worth of past and future toxicological research by various firms and institutions, and to make it generally available.

Said MCA President William Foster to the Industrial Health Conference in Houston last week, in describing the proposal: "Chemical hazard problems remain to be solved and new ones arise with new developments. These problems . . . are obligations of all industry and particularly the American chemical industry . . . These challenges will be met."



THREATENED: Rayonier's \$25-million investment . . . when fish died.

## Fish Fan a Fracas

Dead fish are causing plant management at Rayonier Corp.'s new cellulose plant in Jesup, Ga., to sweat out a stream pollution injunction coming up Oct. 2. But, more important than the legal aspects involved, the case throws the company's public relations progress—so evident when production started last May—into a backslide.

Bringing matters to a head was a perturbed Altamaha River fishing park lessee, who filed the injunction (granted on no sure evidence that Rayonier was at fault), charging that a similar pollution problem was traceable to a Macon, Ga., pulp mill. But his charge simply points up a condition chemical companies through the South constantly face.

**All in Good Faith:** Like many other Southern states, Georgia has no anti-pollution laws, still operates under the old English doctrine of riparian rights. When Rayonier built its \$25-million cellulose plant at Doctortown, there was no legal requirement to be met regarding dumping of wastes into the stream. It is generally agreed, therefore, that the company acted in all good faith when it incorporated a seven-day waste retention and equalizing basin into the plant's design.

But its gesture was to no avail. When trouble started, some three weeks ago, Rayonier (the only large plant in the area) became the target for abuse. Almost as soon as the dead fish, ranging in size from the smallest

shrimp to a 35-lb. catfish, began lining the banks and sandbars of the Altamaha River, Ernest Robarts, owner of a fishing park 20 miles downstream filed his suit against the company. Next move: the temporary restraining order was issued to stop effluent dumping, and Rayonier is in danger of being forced to shut down production.

Punctuating the confusion: the Altamaha River is close to an all-time low level . . . and could (as one resident biologist points out) be the source of all the trouble itself. Backing his contention: Thomas Stein (Rayonier's plant manager) cites a recent similar case of unexplained fish deaths at Lake Enola, Fla. "There," he says, "3,000 lbs. of fish died because of suffocation and decayed vegetation."

Stepping in the muddle in an official capacity was Georgia's Governor Herman Talmadge, who has ordered the State Game, and Fish Commission, the State Health Dept. and the Attorney General to take a closer look at the chemical pollution problems in Georgia. But from a public relations angle, his move may have come too late for Rayonier. Though company officials have enlisted aid from Alabama Polytechnical Institute and the National Council for Stream Pollution, and have been assured that there's no proof that Rayonier caused the fish deaths, it seems that the fat's already in the fire.

Georgians call it "one of the worst



stream pollution cases in the state's history," and possible hints of additional injunctions are looming on the horizon. Rayonier is now on the defensive, and though it has publicly emphasized its "responsibility to the community, and to the state," it will be many moons before local Georgia residents forget about the dead fish.

## EXPANSION . . . . .

**Sulfur:** The Tehuantepec Co., Houston, plans to build a sulfur plant in the state of Vera Cruz, Mexico, for Companie Azugre Veracruz S.A., a subsidiary of Gulf Sulphur Co., Kansas City, Mo. Cost has not been released, but the plant's scheduled for completion by next May.

Gulf, according to officials of the Security & Exchange Commission, has filed a statement seeking registration of 92,310 shares of stock to finance the expansion move—all but 35,000 of which will be offered for public sale by Fridley and Hess, and Crockett and Co., two Houston underwriting houses.

**Aluminum:** Delay in construction work on Harvey Machine Co.'s proposed aluminum reduction plant at The Dalles, Ore. (near the site of the huge federal hydroelectric dam project on the Columbia River), is being caused by the company's refusal to include aluminum fabrication operations in its plans for the \$65-million facilities. That, at least, is the explanation of Sen. Guy Cordon (R. Ore.) in answering Democratic charges that the Eisenhower Administration power policy has stalled the DMPA-approved Harvey plan.

The Oregon Senator further explained that the whole misunderstanding arose when Congress decided to eliminate about \$1 million for facilities to connect the Bonneville Power Administration to Harvey's proposed plant. Its reasoning: since there was the prospect of a one-year delay of power delivery at The Dalles powerhouse, the work could wait to be taken up in another fiscal year.

But Harvey executives objected to the reduction, petitioned Cordon's office for help in having the transmission funds restored. Cordon counterproposed that he would see what he could do about the situation "if the company would agree to a certain amount of fabrication work as well as reduction." But this the company has refused to do.

Adding another official stamp to the whole situation: Secretary of the Interior Douglas McKay says that "omission of power facility funds from the current budget needn't delay Harvey's plans. When it (Harvey) shows evi-

dence that the plant will be built, Interior will supply the power."

**Ammonia:** Standard Oil Co. (Indiana) and Sinclair Refining Co. have jointly revealed their plans to build one of the Midwest's largest ammonia plants. To be located in Hammond, Ind. (near Standard's Whiting refinery and Sinclair's East Chicago refinery), the plant will have a capacity of 300 tons/day of anhydrous ammonia, will also produce solutions of ammonia and ammonium nitrate. Target date for completion of construction: early 1956.

Both refineries will feed by-product hydrogen and other gases into the plant from their nearby refineries; and both companies will separately market their portion of the output.

## COMPANIES . . . . .

**American Cyanamid Co.** has filed deeds on most of the "access strip" in Dixiana, S.C., adjacent to the site on which it's expected to build a major new plant. Cost of the land (on which Cyanamid's options would have expired Sept. 1): \$260.

**Shea Chemical Co.,** Baltimore, has purchased an 80-acre tract in Maury County, near Kettle Mills, Tennessee, as the site for phosphate rock mining facilities. No construction work is

planned for the immediate future. However, significantly, this is the first phosphate land the Shea firm has bought.

**The Atomic Energy Commission** (Grand Junction, Colo., office) has signed a contract with Anaconda Copper Mining Co., Butte, Mont., to build an addition to its uranium-ore-processing plant at Bluewater, N.M. AEC says that expansion is predicated on recent discovery of additional deposits of sandstone uranium-bearing ore in the Grant, N.M., area.

**Camoose Mines, Ltd.** of Canada has purchased three operating mines and 375 mining claims in Montrose County, Colorado, from the J. R. Simplot Co., Boise, Idaho. Terms of the transaction have not been revealed, but industry sources at Grand Junction, Colo., says the deal is the second largest uranium purchase agreement this year. (Second only to sale of the Vernon Pick Delta mine to Floyd Odlum's Atlas Corp. for \$10 million.)

**National Starch Products, Inc.** and Clinton Foods, Inc. are discussing the possibility of merging Clinton Foods' Corn Processing Div. with National Starch. No final agreement has been reached.



WIDE WORLD

## Pause to Preview

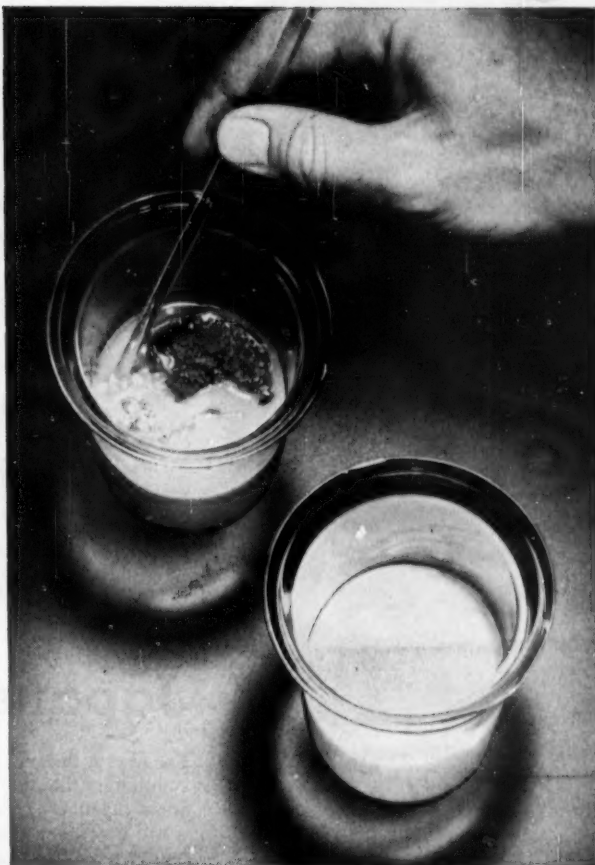
IN BOULDER, COLO., last week, while dedicating two laboratories to the "welfare of humanity," President Eisenhower dropped in to

watch engineer Russell Scott dip a piece of pliant rubber into a container of liquid nitrogen (320° below zero).



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**DOW**



**KATO'S DAY:** Begins around 7 a.m. with a crack at the day's news . . .



followed by breakfast—part Western, part Japanese style . . .



. . . a traditional Japanese send-off . . . and a stroll to the subway.



**KATO OFTEN** meets a friend on his daily trek through the local business district . . .

## Japanese Trader: New Force

For over a decade, the U.S. chemical community has hardly had to think about Japan. It's been a minor factor in world trade, a competitor of little consequence.

But that's all changing. It's no secret that some day—and some day soon—exports will become a matter of life and death to the Japanese people. And for a nation with limited natural resources, poor-quality coal, small, low-grade iron deposits and few oil fields, the export emphasis will have to be not

on crude raw materials, but rather on more profitable manufactured products.\*

That will pit Japan squarely in competition with industrial nations—like the U.S. Inevitable result: plenty of economic and political pressure.

Actually, until very recently, the Japanese (and particularly the Japanese chemical industry) have nurtured a rather defeatist (or let's-not-bother) attitude toward foreign trade. Part of the attitude, undoubtedly, arose out of



**WORK STARTS** with the familiar run-down of the day's mail with secretary . . .



... in the jam-packed subway, in Tokyo's modern underpass in the bustling Marunouchi business district, or waiting for an elevator.

## to Reckon With

the belief that the U.S. will continue to underwrite Japan's economy. But equally important is the fact that Japan can't, at the moment, do very much about increasing its chemical exports in light of the current set of restrictions imposed upon it.

**Walls on Both Sides:** From the viewpoint of the typical Japanese chemical exporter, the limitations on his activities are considerable. U.S. tariff walls thwart him on the one hand; and em-

bargoes on shipment to continental China curb him on the other. Result: there has been much talk in Japan about boosting export quotas—but there's been very little drive to develop export trade.

Typical commentary heard among Japanese chemical manufacturers runs something like this. *If* the Allies had permitted the Japanese to import salt from Red China . . . or *if* the U.S. had seen fit to increase its financing program "to give the Japanese industry a chance to catch up to the rest of the world" . . . business would not be in its current state of unbalance and

distress. (Overproduction exists in certain lines—predominantly those in which the Japanese have had aid from foreign privately owned companies—shortages are notable in others.) Moreover, plagued by the old problem of obtaining raw materials, the Japanese have been forced to import raw materials at high cost—and that's pushed production costs sky-high. Most vexing problem of all: in those cases where they've had exportable surpluses, the Japanese have found their markets closed off or gobbled up by competitors.

**Signs of Change:** But within the last



... a series of cables, to which Kato applies his "chop" . . . and a quick start on the first of the day's appointments.





AT SCOTT & ENGLISH, Kato irons out polyvinyl powder deal . . .

Story begins on p. 26

few weeks there's been a significant change in attitude toward the export picture in Japan. Leaders of the Japanese Liberal Party have been booming a new economic program designed (through special emergency measures) to increase exports and restore equilibrium in the balance of international payments. Due for special emphasis: reorganization of coal, steel, soda, oil, "and other essential sectors" of the chemical industry in order to concentrate production in high-efficiency plants "which can compete on an international plane." Specifically ticketed for expansion: output of nylon and other synthetic fibers to the tune of 100 million lbs. annually.

The prevailing political philosophy is being reflected among chemical exporters, too—particularly among major trading firms. Alert and eager export managers—such as Dai Ichi Bussan Kabushikiki Kaisha's (Dai Ichi Trading Co., Ltd.) M. Kato (*see cut above*) are busy drumming up business throughout Japan today.

The total volume of chemicals leaving Japan will probably run over \$42 million this year. (Export profit margin: approximately 5%.)

**Watch the Middlemen:** There have even been a few attempts made in past months (especially among Japanese pharmaceutical makers) to break away from the age-old system—whereby manufacturers ship abroad through traders—seldom on their own account. But the pressure brought to bear on such "anarchy" is hard to withstand. And odds are that the long-prevailing trader system will hold its own. That's why Westerners are



continues on foot, past curious mingling of East and West . . .

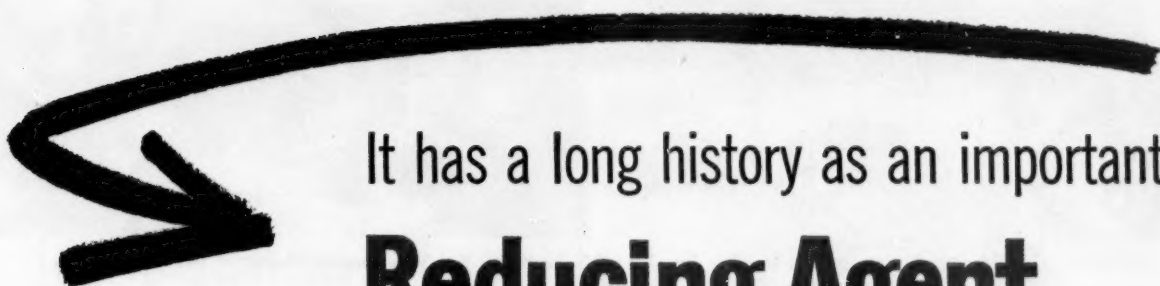


to Toya Soda Mfg. Co., where Kato signs in, clears final details on soda ash contract with India.



# tecquinol

Eastman technical hydroquinone



It has a long history as an important

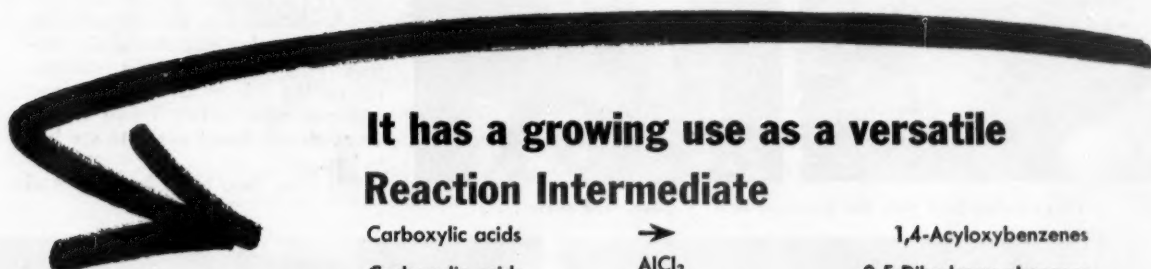
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KINGSPORT, TENNESSEE, subsidiary of EASTMAN KODAK COMPANY

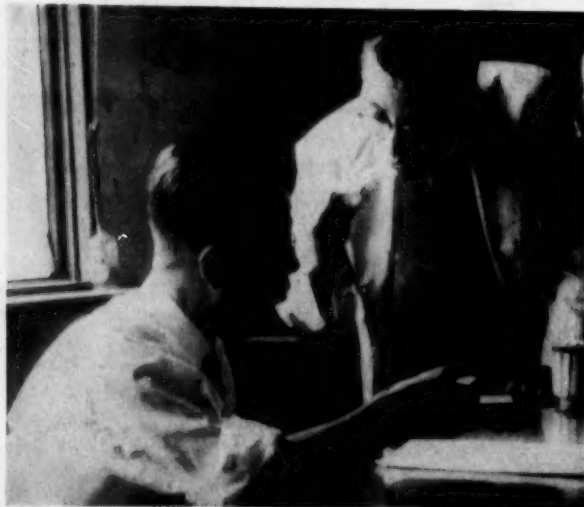
**SALES OFFICES:** Eastman Chemical Products, Inc., Kingsport, Tenn.; New York—260 Madison Ave.; Framingham, Mass.—65 Concord St.; Cincinnati—Carew Tower; Cleveland—Terminal Tower Bldg.; Chicago—360 N. Michigan Ave.; St. Louis—Continental Bldg.; Houston—412 Main St. West Coast: Wilson Meyer Co. San Francisco—333 Montgomery St.; Los Angeles—4800 District Blvd.; Portland—520 S. W. Sixth Ave.; Seattle—821 Second Ave.



SHIPPING DATES settled, Kato returns to office for chat with mentor, S. Tanabe, managing director of Dai Ichi Bussan . . .



. . . another bout with the incessant mail, a quick shoe shine . . .



and a session with the Ministry of International Trade . . . where usual signing-in-and-out ceremony is observed.

*Story begins on p. 26*

closely watching the activities of the major trading companies to size up just what course the new drive on exports will take.

DBK's Kato (manager of the company's chemical exporting division) typifies in many ways today's chemical merchant. Until very recently, domestic chemical trading (for which he's also responsible) comprised about 80% of his business volume and took nearly all his time. To a large extent the burden of selling chemicals overseas rested upon DBK's overseas offices. His role in export selling was rather passive: other Tokyo traders (e.g., British firms) came to see him to buy.

But now, Kato is out hustling. And



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97% (Dense Powder or Granular)  
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☐ Please send samples of following products:

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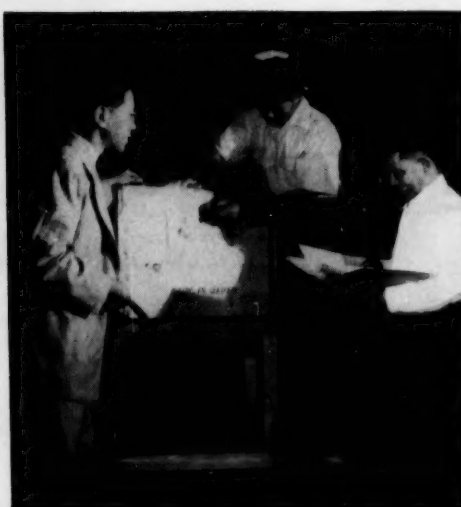
**AA Quality Chemicals**

**The AMERICAN AGRICULTURAL CHEMICAL Co.**

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MOVING ON to Daiichi Seiyaku, Kato stops in packaging rooms, manufacturing plant, and shipping warehouses . . .

his day is largely taken up with arranging export deals—not through a staff of assistants—but in person. His range of activities runs from visiting local clients (usually a Mitsui-born and -bred company in the traditional Japanese manner of keeping deals within the manufacturing family) to submitting samples and quotations to foreign firms.

Sandwiched in between are the inevitable—and frequent—trips to the Ministry of International Trade and Industry to line up export permits.

**No Time to Dawdle:** The stepped-up pace is evidenced everywhere you turn. Activity in DBK's home office (in the Eiraku Building in the heart of the bustling Marunouchi business district) has moved into high gear in

recent weeks. Urgent cables are flashing in and out, to and from, all parts of the world; there's an unusual stack of foreign mail piling up.

With one hand, Kato on a single morning last week, worked out the arrangements for a deal to export polyvinyls to Brazil and Argentina; cleaned up the details on a shipment of 1,500 tons of soda ash to India; cleared a series of other projects with the Foreign Trade Minister. And with the other, he was catching up on correspondence, talking over export possibilities with executives of Daiichi Seiyaku Co., Ltd. (a leading pharmaceutical firm), and planning a dinner party for Y. S. Tou—head of a leading Hong Kong trading company . . . "and a major potential buyer."

For the most part, his contacts with domestic buyers has gone by the boards. Management is clamoring for more foreign trade (spurred undoubtedly by both political and economic conditions at home).

And Kato—a good Keio University man—is carrying out his appointed task with zeal.

Hours are long; the tempo is often hectic (as the increase in number of cups of tea Kato consumes daily indicates); and the pace is wearing (note the alternate hot and cool towels supplied by his secretary).

But like all other jobs that offer both an appeal to a man's sense of patriotism and a challenge to his imagination, Kato's newly defined responsibility doesn't discourage him. Like most young Japanese holding close-to-the-top managerial positions in trading firms, he's naturally gregarious, enjoys the new foreign contacts he's making. (Someday, he confides, he'd like to visit the U.S., take a fling at working out of DBK's New York office.)

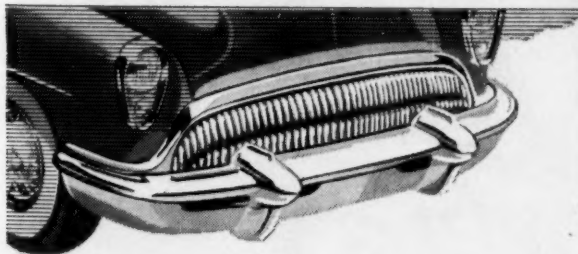
In most other ways, too, he represents the determination of all young Japanese today. Brought up short against the limitations of insularity, he's fully convinced that the only course Japan can follow is that of international cooperation. That belief has finally drifted up to top management, too. Result: DBK and other Japanese chemical exporters are on the move in earnest. How far their drive will penetrate world markets, where their paths will cross those of U.S. companies is still anyone's guess. But that the paths will cross—be it sooner or later—is inevitable.



WINDS UP the day by entertaining prospective foreign buyers at dinner.



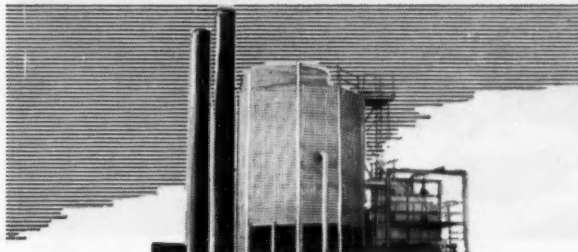
# Mutual Chromium Chemicals Cover Industry



Automobile buyers demand Chromium plating for appearance and protection. Mutual supplies the plating industry with chromic acid assaying 99.75% plus.



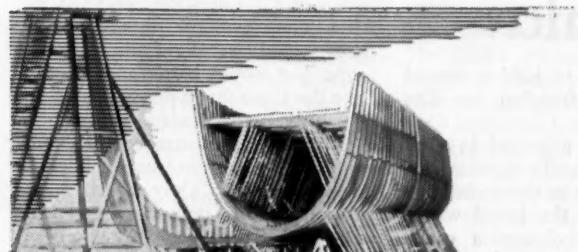
Railroads find that Diesel locomotives with chromium plated cylinder liners extend the periods between overhauling jobs. Another application for Mutual Chromic Acid.



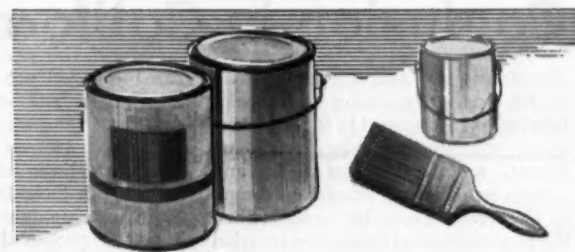
With water becoming scarcer, many industrial users recirculate water in cooling systems. Mutual Chromates effectively control corrosion of equipment.



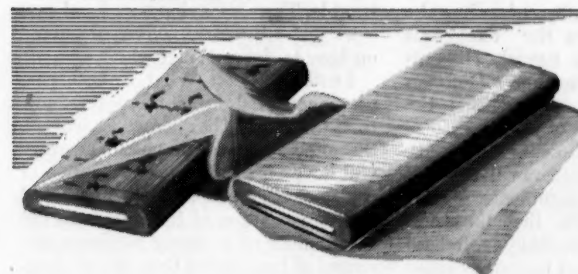
Tanners of superior leather products turn to Mutual for Sodium Bichromate and Korean (one-bath chrome tan).



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DRUG COMPANY LAWYERS Williams (above, left) and Elson face California Board members with barrage of arguments.

## Confusion in California

There's one sure and sane observation to be made concerning last week's hearings on a proposal to tag antihistamines, somnifacients (sleep-producing drugs), and adrenergics (cold and asthma remedies) as "dangerous drugs" in California. From beginning (when the pharmaceutical companies scurried around to round up reinforcements) to end (when advocates of labeling restrictions faded and dodged) the San Francisco meeting was plagued by confusion.

Most of the complaints about certain drugs (particularly those containing desoxyephedrine) were initiated originally by California authorities concerned with juvenile delinquency (e.g., Juvenile Delinquency Division, Los Angeles Police Dept.). The claim: teenagers were using the drugs as a substitute for dope. But when the proposal to term such products as "dangerous"—under state health and safety codes—came up for hearing none of these proponents of restricted sale put in an appearance.

That meant that the drug companies, who had rounded up a battery of legal talent to fight the labeling ban, found themselves "answering charges" that had not yet been made. And their 4-hour counterattack—prepared in some haste—proved unnecessary, when in the final moments the California Pharmacy Board (called up to hear the

case) decided not to hold a second hearing it had scheduled for Los Angeles.

Actually (it was admitted in ante-rooms later) the board's decision surprised both factions in the audience—those who thought the board would give the proposed change a quick burial, and those who had traveled across the continent to engage in what they were convinced would be a rough battle.

**No Holds Barred:** Spearheading the drive to beat down the "dangerous drug" proposal were Beverly Hills attorneys Tom Williams, Dave Hoffman and Eugene Elson, counsel for the California Pharmaceutical Assn. Retained by a pool of drug companies, Williams and Hoffman ran the gamut of jurisdictional arguments. They charged for example, that the California Board was challenging federal regulations by seeking to countermand federal laws and asserted that the word "misuse" could in no way be equated to the word "dangerous" as defined in the Dangerous Drugs Act.

But the fact that no proponents of stricter sales regulations showed up took the sting out of their words. "Nearest anyone could get to the plaintiff," moaned one member of the defense, "was to the recitation of six or seven letters of complaint."

The stand taken by two firms—Ab-

bott and Eli Lilly—also muddled the issue. Their publicly stated position: they would not fight any labeling move, but would battle any drive to have the three drugs put in a "sale-by-prescription-only" category.

Other leading pharmaceutical companies, however, were not inclined to be so generous. "Only effective opposition to this type of complaint," asserted one drug company executive privately, "is to fight strictly on jurisdictional grounds—giving no quarter anywhere. If you admit they can call them dangerous drugs, you're in for trouble. Then it's no longer a legal case—it's just a three-ring circus argument on how to define dangerous."

**Lasting Effect:** What is bothering pharmaceutical firms the most, now that the smoke has cleared away, is the effect the San Francisco hearings will have on sales. A representative of Inhiston, for example, asked the board to strike mention of Inhiston from the record since no evidence had been presented of bad results from use of drug. The board refused.

The consensus is that the California proposal won't induce other states to restrict sale of antihistamines, somnifacients and adrenergics. But it could have an impact on sales. "If that happens," maintains one East Coast pharmaceutical manufacturer, "we'll seriously consider suing the California Pharmacy Board for the effect of the bad publicity resulting from their bungling."



**PHILADELPHIA'S NEWCOMB:** For his antifuoridation plea, a body blow.

## LEGAL . . . . .

**Difference of Opinion:** In turning down the request of four taxpayers for a preliminary injunction against fluoridating Philadelphia's water supply, Judge Joseph Kun, Common Pleas Court, has given the go-ahead to city officials to start the chemical-adding program. Emphasizing that there's a wide difference of scientific opinion extant concerning fluoridation, Kun said that testimony presented to him did not prove immediate urgency for any ban. Further, he suggested that the controversy is a matter for health and medical authorities to decide.

Leading the injunction plea was Roger M. Newcomb (*see above*). His contention: that chemical treatment of the Philadelphia water supply would cause "irreparable physical harm . . . has no beneficial sanitary purpose."

**Faulty Service:** When Air Reduction's dry ice-making plant exploded in Scranton, Pa., last year, it set off a series of suits still being levied against the company and the Scranton-Spring Brook Water Servicing Co., installers of the blast-causing gas line. Both are now faced with a trespass suit filed in county court by a New York corporation at 60 East 42nd Street.

Delaware and Hudson Railroad Co. is already suing Air Reduction for damages to its freight house by the Oct. 4, '53 explosion.

**Not the Issue:** One of Florida's large citrus firms, Snively Groves Inc., in requesting a rehearing on the recent decision registered against it in an odor abatement suit, and is voicing three

major objections to Judge Register's final decree. Two complaints concern Snively's earnings (labeled attractive by Judge Register), which the company says was never an issue in the suit. The third requests recognition of Snively's collaboration with the University of Florida—which is attempting to solve the citrus waste disposal problem by spring of 1957. Judge Register gave Snively only a year to eliminate the objectionable odors from its plant.

**Those Elusive Chemicals:** After testifying that no injurious chemicals escaped from its plant in South Charleston, W. Va., last June 15, Carbide and Carbon Chemicals Corp. dropped a decision to a plaintiff seeking compensation for a paint-damaged motor vehicle. The company's loss: \$86.70. Truck driver John White in Common Pleas Court testified his paint job was ruined after parking on Carbide's parking lot, was granted damages by Special Judge Cyrus Hall.

**To Zone, or Not to Zone:** National Carbon Co., Cleveland, subsidiary of Union Carbide and Carbon Corp. (running up against opposition from local residents, has abandoned plans to build a \$4-million research laboratory and office on the 72-acre Bay Golf Course site in Bay Village, a suburb of Cleveland. Meanwhile, the issue of zoning the golf course for nonresidential use will be decided at the November election. There's still a chance that National Carbon will locate in the area, however. The village council at nearby Avon, O., has gone on record as ready to do everything possible to entice National Carbon's plant to Avon, is offering potential sites to the company for its consideration.

## LABOR . . . . .

**Twin Probes:** Unions have double trouble this week. Senator Irving Ives (R., N.Y.) is spearheading the Senate's probe of reported abuses and mismanagement of union welfare and pension funds, which may foment more charges of an "antilabor Administration." At the same time, a House Labor subcommittee, headed by Rep. Samuel McConnell, Jr. (R., Pa.) began public hearings in Los Angeles last week on the touchy union welfare question.

In New York State, as a result of special hearings held before the State Insurance Superintendent, suspensions have already been leveled against top officials of five CIO Retail, Wholesale and Department Store Union affiliates.



**SENATOR IVES:** With promise of co-operation, a look into welfare funds.

Indicative of the union's cooperative attitude, however: Sen. Ives, New York state's slated Republican nominee for governor, has made public letters from both AFL and CIO presidents pledging full support of the Senate investigation.

**Work at a Standstill:** Work halted last week on Pike County, Ohio's Portsmouth area Atomic Energy plant, with an estimated 18,000 persons idled in a labor dispute. Pickets patrolled gates at the plant, where only maintenance crews remained on the job. Ostensible reasons for the walkout: the AFL Building Crafts Union claims that construction work is being done by nonmembers of the Portsmouth Building Trades Council (AFL).

Neither the unions involved nor the prime contractor for the plant has made any official statements about the strike. But a union spokesman—who asked to remain anonymous—said that the contractor, Goodyear Atomic Corp., had assigned men to tasks that the building crafts claimed was within union jurisdiction.

Goodyear will be the operator of the plant when production starts. Now it has some 2,000 employees working in the plant, but none is involved in the current construction walkout.

**Flash in the Pan:** Last week's three-day wildcat strike at West Virginia Pulp and Paper Co.'s plant at Covington, W. Va., has ended but the union is calling for "an investigation of the company's entire labor relations program." The union (Local 675, United Paper Workers of America, CIO) contends that the strike was precipitated





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ALUMINUM NITRATE PURIFIED  
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Assay ( $\text{Al}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$ )	98.0-102.0%	99.0 %	98.0 %
Insoluble Matter	0.005 %	0.01 %	0.01 %
pH of 5% Solution at 25°C	2.5-3.5		
Heavy Metals (as Pb)	0.001 %	0.005%	0.01 %
Sulfate ( $\text{SO}_4$ )	0.005 %	0.01 %	0.02 %
Iron (Fe)	0.002 %	0.005%	0.005%
Free Acids (as $\text{HNO}_3$ )		0.1 %	0.3 %
Chloride (Cl)	0.001 %	0.002%	
Earths and Alkalies (as $\text{SO}_4$ )	0.05 %	0.10 %	
Alkalies (as $\text{Na}_2\text{O}$ )			0.05 %
Clarity of Solution			Clear

## CADMIUM COMPOUNDS

CADMIUM ACETATE  
REAGENT CRYSTAL  
CADMIUM CHLORIDE  
REAGENT CRYSTAL  
CADMIUM CHLORIDE  
PURIFIED CRYSTAL  
CADMIUM NITRATE  
REAGENT CRYSTAL  
CADMIUM NITRATE  
PURIFIED CRYSTAL  
CADMIUM SULFATE  
REAGENT CRYSTAL  
CADMIUM SULFATE  
REAGENT ANHYDROUS  
POWDER

● Baker Cadmium Compounds meet the exacting requirements of the television, photographic, battery, chemical and other key industries. Representative are Cadmium Nitrate and Cadmium Chloride, available in the grades and specifications listed below:

	Cadmium Nitrate Reagent, Crystal	Cadmium Nitrate Purified, Crystal		Cadmium Chloride Reagent, Crystal	Cadmium Chloride Purified, Crystal
Chloride (Cl)	0.001%	0.005%	Assay ( $\text{CdCl}_2 \cdot 2\frac{1}{2}\text{H}_2\text{O}$ )	99.0-100.9%	98.0 %
Iron (Fe)	0.001%	0.002%	Insoluble Matter	0.005 %	0.010 %
Sulfate ( $\text{SO}_4$ )	0.003%	0.005%	pH of 5% Sol. at 25°C	3.5-5.0	3.0-5.0
Copper (Cu)	0.002%	0.005%	Lead (Pb)	0.001 %	0.003 %
Zinc (Zn)	0.05 %	0.05 %	Nitrate ( $\text{NO}_3$ )	< 0.003 %	
Lead (Pb)	0.005%	0.005%	Sulfate ( $\text{SO}_4$ )	0.005 %	
Insol. Matter	0.005%		Ammonium ( $\text{NH}_4$ )	0.001 %	
Arsenic		0.001%	Copper (Cu)	0.0005 %	
Solution (10%)		Clear	Iron (Fe)	0.001 %	
Substances not pptd. by $(\text{NH}_4)_2\text{S}$ (as $\text{SO}_4$ )	0.10 %		Substances not pptd. by $\text{H}_2\text{S}$ (as $\text{SO}_4$ )	0.20 %	
			Zinc (Zn)	< 0.05 %	
			Thru U.S. No. 20 Sieve		Max. 15.0%



## Baker Industrial Chemicals

*"Purity by the ton"*



# TONNAGE CHEMICALS

... heavy metal compounds of controlled purity

## ZINC COMPOUNDS

ZINC ACETATE TECHNICAL  
ZINC BROMIDE SOLUTION  
OPTICAL GRADE  
ZINC CHLORIDE REAGENT  
ZINC CHLORIDE N.F.  
BROKEN LUMP  
ZINC NITRATE REAGENT  
ZINC NITRATE TECHNICAL  
ZINC OXIDE REAGENT  
ZINC SULFATE U.S.P.  
GRANULAR  
ZINC THIOCYANATE

● Baker provides a dependable and economical source of Zinc Compounds for pigment, adhesive, metal treating, rubber, ink, paint and other manufacturers. Typical are Zinc Nitrate and Zinc Acetate, with these specifications:

	Zinc Nitrate Technical, Crystal	Zinc Acetate Technical, Crystal
Assay ( $\text{Zn}(\text{NO}_3)_2$ )	63.0-70.0%	( $\text{Zn}(\text{C}_2\text{H}_3\text{O}_2)_2 \cdot 2\text{H}_2\text{O}$ ) 98.0 %
Insoluble Matter	0.015 %	0.010 %
pH of 5% Solution at 25°C	4.5-6.0	6.0-7.0
Lead (Pb)	0.010 %	0.005 %
Copper (Cu)	0.002 %	

Baker can supply these METALS	in these forms	Chloride	Bromide	Sulfate	Nitrate	Phosphate	Carbonate	Acetate	Chromate	Oxide	Miscellaneous
Chromium		R									PR
Molybdenum				PR	R						TPR
Manganese		R			PR						P
Iron (Ferric)				PR							PR
Iron (Ferrous)				PR	PR						
Cobalt		PR		R	PR						R
Nickel		PR	R	TPR							R
Copper		PR	PR	PR	PR						TPR
Zinc		PR		PR	PR						TPR
Cadmium		PR		PR	PR						R
Mercury		R		PR	TPR						PR
Aluminum		PR									R
Tin (Stannic)		TR			TPR						TPR
Tin (Stannous)		TR			PR						R
Lead		R									P
Bismuth											
Bismuth (Sub)											

KEY TO CHART  
1—Technical Quality  
2—Purified, U.S.P., or N.F. Quality  
3—Reagent Quality

Black—Carloads  
Grey—Tonnage

Appropriate color designations and symbols indicate those chemicals we can supply in carloads, those in tonnage lots, and the quality grades available.

## HEAVY METAL COMPOUNDS

● Whatever your needs for heavy metal compounds, check Baker. As shown by the chart to the left, Baker can supply a wide variety of these industrial chemicals in tonnage quantities — to precise standards of purity.

The economy of these chemicals will keep your costs low, and Baker's reputation for prompt shipment means "on time" production schedules.

In any quantity Baker "know-how" means industrial chemicals of measured purity. *It pays to buy Baker!*

**J. T. BAKER CHEMICAL CO.**

Executive Offices and Plant, Phillipsburg, N. J.



## FREE Reference File — Baker Process Chemicals

This handy letter-size file folder keeps all your process chemical information handy.

Contains availability charts of Baker Light Metal Compounds, Heavy Metal Compounds, Acid (Inorganic, Organic, Acid Anhydrides) and complete price schedules.

A post card from your secretary brings you this free, useful reference file promptly.



# We can help you TURN WASTE into PROFITS

The skilled personnel and extensive equipment of the United States Testing Company can give valuable assistance to your waste reclamation projects . . . even to the execution of a complete program.

The Testing Company has worked on the reclamation of waste materials in many diversified fields. It has contributed to the conversion of orange peels, a waste product in the frozen juice industry, into profitable paper pulp, cattle food, and commercial pectin. Rock quarry dusts have been established as an extender for plastics, and textile fiber waste is now being reprocessed into commercial products because of Testing Company research. These are just a few waste reclamation achievements.

Take advantage of this important, profitable field of research today . . . by letting the Testing Company's experienced staff examine your waste for hidden values — and new profits!

## UNITED STATES TESTING COMPANY, INC.

*offers scientific and technological services in the fields of chemistry, physics, biology, engineering, and psychometrics . . . testing, inspection, applied research, product development, and product evaluation. These services available for application to problems, small or large, separate or continuing.*

ESTABLISHED 1880

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PHILADELPHIA • BOSTON • PROVIDENCE  
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HAMILTON • MONTREAL  
Toronto • Winnipeg

## BUSINESS & INDUSTRY

when the company suspended a pipefitter for refusing to work overtime.

More than 160 other pipefitters walked off their jobs in sympathy.

**Big Gripe:** Some long-smoldering interlocal union dissension is flaring up at Goodyear Tire and Rubber Co., Akron. From latest reports, it looks as if craft engineers-pipefitters, carpenters, electricians are maneuvering to break away from Local 2, United Rubber Workers (CIO) and establish their own independent "engineering, maintenance, and construction association." Some 1,400 of the 2,000 Goodyear technicians plan to petition the NLRB.

To head the move, the group has elected John Quinn. Frist attempt to pull out of Local 2 was in 1953; since then officers of Local 2 have thwarted similar attempts.

Quinn says the big complaint of the craftsmen is that they are being tied into a production contract; also, that other union and nonunion men are permitted in the plant, performing work they believe should be done by them.

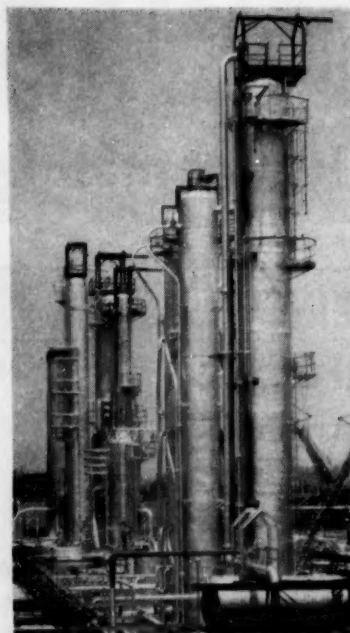
**Strikes in Chemical Industry:** For the first time in its 41-year history, the Ashland, Ky., plant of Semet-Solvay (Allied Chemical and Dye Corp.), shut down last week after a breakdown in negotiations to sign a new contract between United Gas, Coke and Chemical Workers (CIO) and the company. The strikers demand: better wages, better working conditions.

## FOREIGN . . . . .

**Sulfur/Mexico:** The Mexican National Confederation of Chambers of Commerce has just released a study that predicts that Mexico will eventually produce up to a million tons of sulfur per year. Current production is running about 200,000 tons/year; but another major development (Pan American Sulphur Co.'s expansion in the Tehuantepec Isthmus) may add 500,000 tons/year to Mexico's output by 1955.

**Oxygen/Venezuela:** Cia. Los Andes Axygeno's \$120,000 oxygen-producing plant at San Cristobal, Venezuela, is expected to be completed by October. Also ticketed for completion soon: units to produce calcium carbide and acetylene.

**Paper/Venezuela:** Venezuela may also have its own paper-producing mill within the next year. Executives of C. A. Venezolana de Pulpa y Papel (recently incorporated with capital of



**SULFUR** from Permex plant at Posa Rica adds heavily to Mexico's production.

25 million bolivars) are studying offers from the U.S., Sweden, Finland and Germany to supply equipment for a 25-30,000-ton paper and cardboard plant. Their decision will hang on whether Venezuelan raw materials can be used in production.

**Synthetic Fibers/Philippine Islands:** Roxas Kalaw Textile, Inc. has been incorporated in Manila to turn out rayon and other synthetic fiber textiles. First project planned: a \$250,000 plant at Polo, Bulacan—just north of Manila—designed to produce 20,000 yds. of rayon, 15,000 yds. of other synthetics daily. When in full operation, the company figures to save the Philippines about \$500,000 in import costs annually.

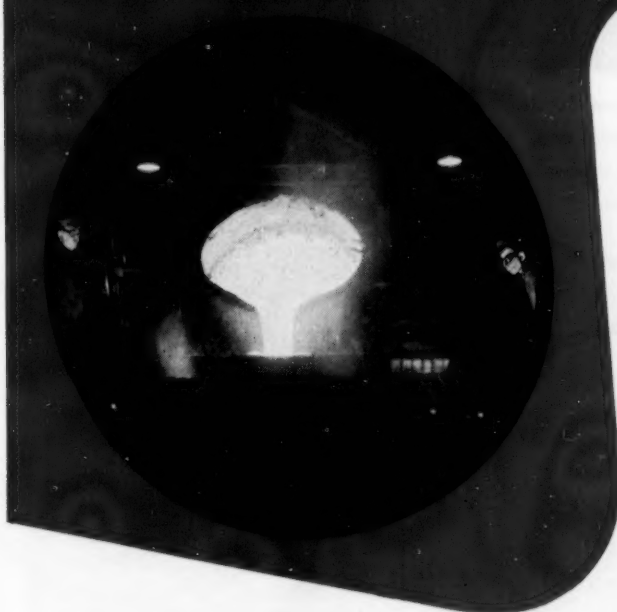
**Fertilizer/Egypt:** In a move to facilitate speedy development of Egypt's fertilizer industry, Hassan Marey, Egyptian Minister of Commerce and Industry, has asked Point Four experts (now in Cairo) to draft fully detailed projects for the benefit of interested foreign businessmen. Then bids will be sought for construction, probably within the next six months.

**Phenol/South Africa:** South Africa's chemical industry is expecting to receive another fillip shortly when Sasol's \$85-million oil-from-coal plant comes onstream. Sasol's present plan is not to process the range of chemicals that

**STAUFFER**  
supplies  
the Chicago  
area....



the nation's leading steel center



"Things change"—and an example is the Chicago metropolitan area's new position as the nation's leading steel producer. In 1953, newly expanded capacities enabled production of a record-breaking 20 million tons of steel.

Unchanged is Stauffer's position as the leading acid producer in the Chicago industrial area. By maintaining excellent service to the growing industrial community, Stauffer has earned a reputation as a dependable supplier of sulphuric acid and other "work-horse" chemicals such as caustic soda, industrial sulphurs, carbon bisulphide and chlorinated solvents.

Coast to coast, Stauffer's 38 plants supply a variety of chemicals for industry. Sales offices are located conveniently to assure prompt handling of your requirements.

**Stauffer  
Products:**

*Aluminum Sulphate\**  
*Borax*  
*Boric Acid*  
*Boron Trichloride*  
*Carbon Disulphide*  
*Carbon Tetrachloride*  
*Caustic Soda*  
*Chlorine*  
*Citric Acid*  
*Copperas\**

*Cream of Tartar*  
*Ferrie Sulphate\**  
*Fire Extinguisher Fluid*  
*Insecticides and Fungicides*  
*Muriatic Acid\**  
*Nitric Acid\**  
*Perchlorethylene*  
*Potassium Nitrate*  
*Rochelle Salt*

*Silicon Tetrachloride*  
*Sodium Hydrosulphide*  
*Sodium Silico Fluoride\**  
*Sodium Sulphate\**  
*Sulphur (processed)*  
*for all uses*  
*Sulphur-Rubbermakers*  
*Sulphur-Insoluble (in CS<sub>2</sub>)*  
*(special-purpose rubber-making)*

*Sulphur Chlorides*  
*Sulphuric Acid*  
*Superphosphate\**  
*Tartar Emetic*  
*Tartaric Acid*  
*Titanium Tetrachloride*  
*Titanium Trichloride*  
*Solution*  
*"Zol" Dry Cleaning Fluid\**  
*(\*West Coast Only)*



**STAUFFER CHEMICAL COMPANY**

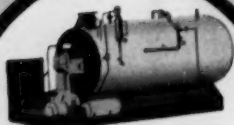
380 MADISON AVENUE, NEW YORK 17, N. Y.

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326 S. Main Street, Akron 8, Ohio • 824 Wilshire Boulevard, Los Angeles 14, Calif. • 8901  
Hempstead Road, Houston 8, Texas • North Portland, Ore. • Weslaco, Texas • Apopka, Fla.



# Maas SODIUM SULFITE

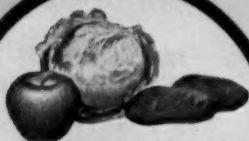
Serves many industries  
**BETTER**



Maas Sodium Sulfite is widely used in boiler water treatment.



Maas Sodium Sulfite is an excellent selective depressant in ore flotation.



Maas Sodium Sulfite helps food processors with quality control.



Maas Sodium Sulfite helps natural and synthetic rubber reclaimers.



Maas Sodium Sulfite helps make better paper.

**Maas**

A. R. MAAS CHEMICAL CO.  
Division Victor Chemical Works  
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SOUTH GATE, CALIFORNIA



**OTHER MAAS  
AND VICTOR  
CHEMICALS  
FOR INDUSTRY**

Sodium phosphates—  
Ammonium phosphates—  
Calcium phosphates (Food grade  
and stock feed grades)—Potassium  
phosphates—Phosphoric acid—Surface  
active agents—Oxalic acid—Oxalates—  
Formic acid—Formates—Acetic acid  
—Sodium hyposulfite—Sodium sul-  
fite—Sodium carbonate—Trietha-  
nolamine phosphate—a full range  
of photo pure chemicals—  
and many more.

will flow from its retorts (including phenols, waxes, and industrial solvents), but to sell them (either domestically or abroad) to manufacturers.

Whether local industry can buy, however, will hinge on Sasol's pricing policies. State-controlled industries in South Africa in the past have been prone to "soak the home market in order to win favorable export prices." If that happens in Sasol's case, local manufacturers say, they'll continue to buy abroad "or be forced to go out of business."

**Plastics/South Africa:** African Explosives and Chemical Industries, Ltd., (the South African link in the Imperial Chemical Industries chain) is building a \$5.6-million plastics and solvents plant at Natal, South Africa. Due in early next year, principal products will include: chlorine, caustic soda, trichloroethylene, hydrogen, acetylene, and polyvinylchloride.

Nine ICI production experts have been transplanted to Africa to help train South Africans to operate the plant, which has been (in the truest sense of the word) hacked out of the South African bush.

**Gypsum/Venezuela:** Venezolana de Cementos (a recently incorporated Venezuelan firm) is building a gypsum plant at Pertigaleta, Anzoategui, to produce 7,000 bags/day of gypsum. Mining in nearby Cristobal Colon will start in early November. Additional production of gypsum in Venezuela will do much, local authorities maintain, to alleviate current shortages and reduce costs since Venezuela is now forced to import almost all its domestic requirements.

## KEY CHANGES . .

**John Bolton**, to the board of directors, General Tire & Rubber Co., Akron, O.

**Robert C. Houser**, to assistant treasurer, H. K. Porter Co., Inc., New York City.

**Walter C. Thilking**, to assistant controller, Monsanto Chemical Co., St. Louis.

**Frank J. Monaghan**, to general sales manager, Explosives Div., Olin Mathieson Chemical Corp., East Alton, Ill.

**John G. Meitner**, to director of chemical research, Atlantic Research Corp., Alexandria, Va.

**Albert W. Meyer**, to director of exploratory research, Diamond Alkali Co., Cleveland.



# Airstream CONVEYORS IMPROVE PROFIT PICTURE!



■ At a major Ohio appliance plant, two "Airstream" Conveyors—added to an existing Dracco Dust Control system—have made a profitable operation even better!

Nine roof-mounted Dracco Filters ventilate spray booths and recover porcelain enamel dusts worth some \$36,000 per year. Returning clean, filtered air to the plant saves on heating costs.

"Airstream" Conveyors replaced previous methods of handling collected dust by hand dump cart. Now, separate pneumatic systems convey "ground" and "finish" coat enamel from filters to storage for

reuse. Completely enclosed conveyors handle all materials in a fast, dustless, automatic operation.

This "Airstream" installation provides added economies through:

- (1) Savings of 16 man-hours per day formerly required for manual handling
- (2) Elimination of material losses thru blowing and spillage
- (3) Elimination of wear and tear to roof surface

Why not find out where Dracco's cost-cutting team of dust control and "Airstream" conveying can improve *your* profit picture?

**DRACCO CORPORATION**  
4080 EAST 116th STREET • CLEVELAND 5, OHIO

Original Dracco advertisement on appliance plant told how Multi-Bag Filters produced major cost-savings by recovering valuable porcelain enamel. Now . . .

. . . this plant has improved its operating economy with two "Airstream" Conveyors for returning dusts from filters to storage. Receiver for one system is in foreground.

# DRACCO

Performance Proved

Airstream CONVEYORS • DUST CONTROL EQUIPMENT

# New products and profits with Armour Chemicals

**Arquad 2HT gives a  
soft finish to all fabrics—  
natural and synthetic!**

Laundries and textile manufacturers have one problem in common—providing their fabrics with a soft finish. Whether it's a new fabric being sold to a textile buyer or a towel coming back from a laundry, it must look and feel soft.

Armour chemists have proved that a single rinse with Arquad 2HT provides this added softness! Arquad 2HT works well on all fabrics—natural and synthetic—and has been found unusually effective on cotton. Besides a soft, fluffy finish, Arquad 2HT gives fabrics anti-static properties, too. For most softening operations, only 1 pint of 10% solution is necessary for every 100 lbs. of dry fabric. For rewashing,  $\frac{3}{4}$  pint of solution is adequate.

And Arquad 2HT is just as effective in the home laundry. Supplied as a concentrated dispersion of distearyl dimethyl quaternary ammonium chloride, you merely dilute with water and package for the consumer market.

Send today for Armour's Technical Bulletin and for samples of Arquad 2HT. Test this new softening agent now—you'll want to add Arquad 2HT to your line as soon as possible!





### New stearic acid comes out of the lab— and into fine candles and cosmetics!

Consumer acceptance of your products depends on both quality and price. With this in mind, the Armour Chemical Division has developed a new triple pressed stearic acid—Neo-Fat 18-55—to give you higher quality at no increase in price.

The heat and color stability of Neo-Fat 18-55 assures longer-lasting, fresher-smelling cosmetics and other allied products. Manufacturers report that it is highly stable to high temperature processing. Tennessee Eastman, sulfuric acid and other tests prove its stabil-

ity to heat, light and oxidation.

Candle manufacturers are constantly on the lookout for low ash content in stearic acid for better wick action. One manufacturer reports excellent results with Neo-Fat 18-55; found an ash content of only 0.00009%!

If you manufacture cosmetics, shaving creams or other products which *must* stay fresh, it will pay to investigate this new triple pressed stearic. Samples of Neo-Fat 18-55 are available free; simply mail the coupon.

### Armox® oils in lubricants solve cold weather and hot water problems!

Steam cylinders present two special lubrication problems. Cold weather causes crystallization of stearines normally present in lubricant raw materials. This leads to sedimentation. Armour Chemical Division now produces an economical low pour oil—Armox LPO—with an extremely low stearine content.

The second problem is that cylinder walls are continually exposed

to hot water from condensing steam. Since steam cylinder lubricants are usually compounded with mineral oil which will not wet steel surfaces in the presence of water, Armour offers an acidless tallow animal oil—Armox ATO—which resists being washed away from the metal.

For samples of these products and our Industrial Oil Booklet, send the coupon today!

ARMOUR CHEMICAL DIVISION

©ARMOUR AND COMPANY  
1355 WEST 31st STREET  
CHICAGO 9, ILLINOIS

### Roundup of new chemicals

Several new chemicals have been offered in this column over the last several months. You may have missed some of these new products. To bring you up-to-date, a brief summary of these developmental chemicals follows.

*Armeen 2S and Armeen 2T*—new (unsaturated) secondary amines, of particular interest in corrosion inhibition problems in oil systems.

*Arquad 2S and Arquad 2T*—quaternary ammonium salts of the above amines, useful in corrosion problems and as cationic emulsifiers and anti-static agents.

*Armeen DMS and Armeen DM18*—new tertiary amines (dimethyl soya and dimethyl stearyl) for evaluation in the fields of sanitation, textile chemicals, and corrosion inhibition.

*N-coco morpholine and N-tallow morpholine*—tertiary amines, useful in general emulsification problems, corrosion inhibition and the sanitation fields.

*Ethoduomeen T/13*—a di-tertiary amine, useful to the petroleum industry for specialized corrosion problems.

*N-coco B amino butyric acid*—an amphoteric amine derivative, the salts of which make excellent detergent additives as foam boosters and stabilizers.

Further technical information and samples of these new chemicals can be obtained from the Market Development Dept.

### MAIL THIS COUPON WITH YOUR LETTERHEAD

ARMOUR CHEMICAL DIVISION  
1355 West 31st Street, Chicago 9, Illinois

Please send me:

- Fatty Acids: ☐ Neo-Fat 18-55 Sample  
☐ Neo-Fat 18-54 Booklet  
 Derivatives: ☐ Arquad 2HT Tech. Bull.  
☐ Arquad 2HT Sample  
 Ind. Oils: ☐ Armox LPO Sample  
☐ Armox ATO Sample  
☐ Industrial Oils Booklet

Name .....

Title .....

Firm .....

Address .....

City ..... Zone ..... State .....

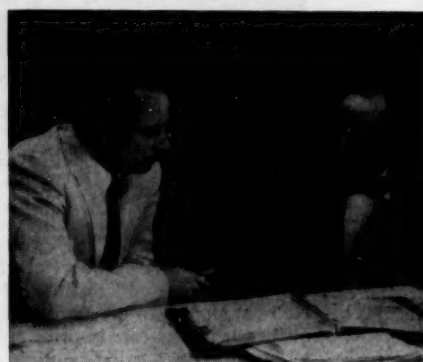
W



# DISTRIBUTION . .



ARRIVING IN HOUSTON, Product Manager Goodwine, greeted by district manager Elbin, becomes acquainted with office routine.



AFTER PLANNING calls, Elbin introduces Goodwine to customer, Magobar's Don Elkins; Goodwine carries on field work.

## Tallying the "Big Switch" Score

With the contract season now upon the industry, Celanese's "Operation Big Switch" (CW, July 3, p. 18) has drawn to a close for this year. The three product managers of Celanese's Chemical Div. who guided the sales tillers in the Chicago, Houston and San Francisco districts during the past

few weeks have turned the reins back to the regular managers. The district heads, fresh from their stint as product managers in the home (New York) office, are picking up where they left off in their customer relationships.

To get some idea of how productive the job-switching idea might be, and

how the six men fared in their personal experiences and adjustments, CW interviewed product managers Norman Baker, William Goodwine and Thomas Davis, compared their reactions with those of their switch partners, district managers Raymond Werner, Elmer Elbin and Harry Snell. And to



MEANWHILE, Elbin learns New York office operations, hears latest news from market research head, A. A. "Tony" Williams.





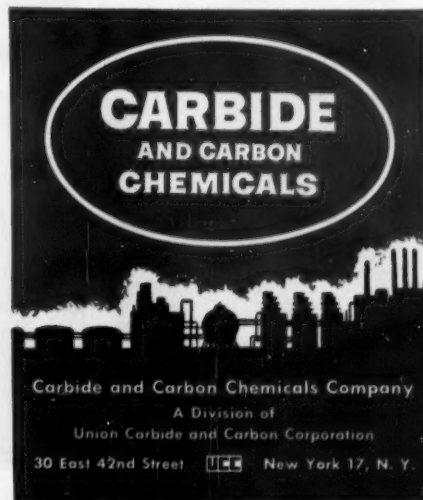
## What Every Buyer Should Know About CARBIDE'S ETHER

*Ethyl ether* is available from CARBIDE in all the regular commercial grades, as well as the U.S.P. grade. Exceptionally pure grades, low in alcohol and water content, are also available. Prompt delivery of all grades is assured since there is a CARBIDE warehouse in every important industrial area.

### ETHYL ETHER IS A:

- Denaturant for ethyl alcohol.
- Useful solvent for the recovery of dilute acetic acid.
- Active solvent for fats and oils.
- Solvent for nitrocellulose in the manufacture of collodion and pyroxylin plastics.
- General industrial solvent.

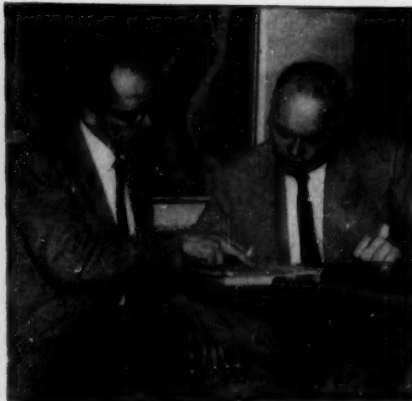
A call to your CARBIDE Technical Representative will bring more detailed information on uses, prices, and shipping facilities for this important ether. In addition, an excellent reference book "Ethers and Oxides," (F-4767) has been prepared for your assistance. In Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.



Story begins on p. 44



IN SAN FRANCISCO, District Manager Snell shows Product Manager Davis around, briefs him on individual customers.



SMOOTHING WAY, Snell takes Davis customer-calling on Monsanto's Guy Frederick (top), Shell's Herb Stanley (top, r.), and Reichhold's Sam Small.



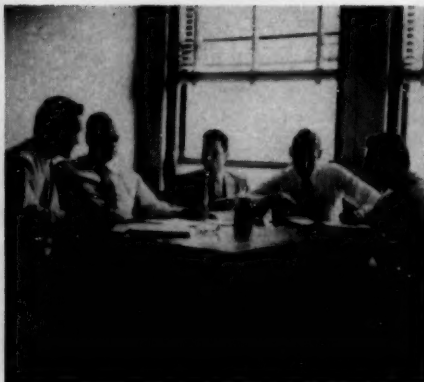
share some actual on-the-spot experiences with the men during switched conditions, CW's camera followed them around.

**Mutual Appreciation:** As Richard KixMiller, general manager of the Chemical Division, pinpoints the job exchange operation, one main goal of the switch "ties in with the philosophy that a man can do his job better if he knows what the other fellow's up against."

Specifically, as John Stevens, general sales manager, chemicals, sees it, the district managers acquire deeper insight into the staff functions in New York. "The fellows here in the New York office," admits Stevens, "think the salesmen don't appreciate the tough staff problems they have to wrestle with."

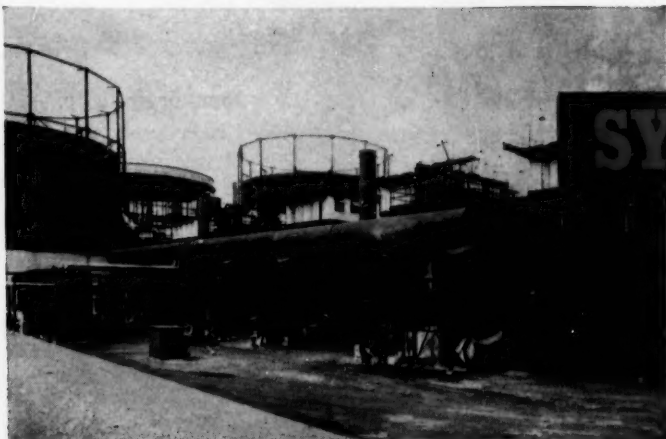
"Likewise, by getting the product managers back into the swing of selling, they are reminded firsthand of day-to-day selling hurdles in an area."

**Worry, Worry:** Beneficial as the switch might be in the long run, changing personnel obviously can be

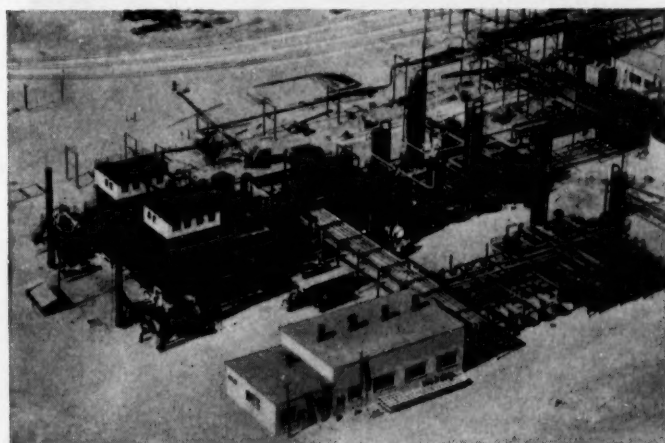


IN NEW YORK, Director of Technical and Economic Research James Worth updates Snell.

A VISIT with Borden's Smith.



AT HOPEWELL, VA.



AT OMAHA, NEB.



AT SOUTH POINT, OHIO

## SYNTHESIS GAS

### Three GIRDLER plants set output record for NITROGEN DIVISION

*Allied Chemical & Dye Corporation*

WITH the three plants shown, Nitrogen Division, Allied Chemical & Dye Corporation, produces more synthesis gas for ammonia than any other company. Girdler designed and built these gas reforming plants at South Point, Ohio; Omaha, Neb.; and Hopewell, Va., and is now installing additional gas reforming facilities in connection with Nitrogen Division's latest ammonia expansion at Hopewell.

These plants, using natural gas as the process material, have given Nitrogen Division these benefits: lower gas production cost, lower purifying cost, simplified control of gas composition, and a saving in ground area.

Find out how Girdler can serve *you* in process design, engineering and construction. Call the nearest Girdler office today.

**GIRDLER DESIGNS** processes and plants

**GIRDLER BUILDS** processing plants

**GIRDLER MANUFACTURES** processing apparatus

#### GAS PROCESSES DIVISION:

Chemical Processing Plants	Sulphur Plants
Hydrogen Production Plants	Acetylene Plants
Hydrogen Cyanide Plants	Ammonia Plants
Synthesis Gas Plants	Ammonium Nitrate Plants
Carbon Dioxide Plants	Hydrogen Chloride Plants
Gas Purification Plants	Catalysts and Activated
Plastics Materials Plants	Carbon

The **GIRDLER** Company

A DIVISION OF NATIONAL CYLINDER GAS COMPANY

LOUISVILLE 1, KENTUCKY

GAS PROCESSES DIVISION: New York, Tulsa, San Francisco

In Canada: Girdler Corporation of Canada Limited, Toronto

## DISTRIBUTION . . . . .

Story begins on p. 44



**MIDWEST** Sales Manager Werner acquaints himself with New York office.



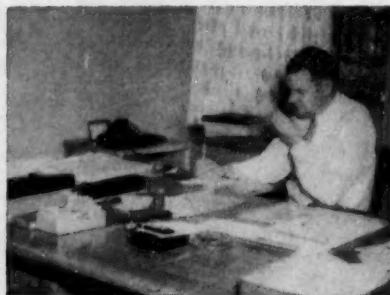
**HIS OWN** district duties temporarily shifted, he goes customer-calling.



**PRODUCT MANAGER** Baker finds out Chicago problems are different.



**WEIGHING** field versus home-office chores, he re-examines his territory.



**SETTLING DOWN**, Werner tackles paper work, handles some inquiries.



**GLAD TO** be in saddle, he's enjoying the 'big switch.'

hazardous, saleswise. Stevens worries, for instance, how customers react to seeing an unfamiliar face.

"Today," he explains, "customers are often just looking for an opportunity not to place an order. They might be disgruntled if the regular man doesn't call upon them."

However, Stevens' risk was hedged in at least two ways:

- The product managers who substituted in the field are all former field salesmen, or even district managers.
- The district managers all returned to their regular posts before the contract season began.

**Product Men Afield:** And just how much did the men themselves gain from the interchange? Here's what the product managers say:

- Solvents manager Norman Baker, who had never been in Chicago, found it "a wonderful opportunity to get acquainted with the problems there—which differ from those of New York. He comments:

"One big difference in the Chicago market, which can be appreciated only at firsthand, is that there we work largely through distributors well established in the area."

Another Baker experience: because the company introduced a new solvent when he was on the scene, he was able to get person-to-person initial reaction to it.

- Plasticizers manager William Goodwine, in taking over the Houston office, was reminded how the regular district man, in order to develop his area, "must have his paper work streamlined and kept to the minimum for intelligent operation."

One other result Goodwine predicts from the job rotation: "We may well develop new end uses for our products. Seeing a large marketing area makes a man better aware of the variety of end uses."

- Intermediates manager Thomas Davis was sent out to the Western Division because that district sells the

greatest volume of formaldehyde.

Davis, who had never been west of Omaha, was most impressed by the "stimulating geography of the West," discovered that because of "the great voids between the centers of population" he had to travel many miles in covering the area.

And in addition to the constant travel problem, Davis was also impressed that "New York deals with figures, while in the field it's personalities that count."

**Home-Office Visitors:** Even as the product managers feel they benefited from the exchange, so do the district men:

- Midwest manager Raymond Werner feels that "you can become a hermit out in a district office. It's good to come in to find out what the company intends to do in the future."

"Coming in to the home office," he continues, "breaks down barriers—they might be mythical, but you don't know what the other fellow is up against or



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CHEMICALS

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## WAXES

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PETROLITE WAX	MELTING POINT °F	PENE- TRATION	COLOR NPA	ACID NO.	SAP NO.
15	180 min.	4 to 6	4-5	14-16	50-60
23	180 min.	4 to 6	4-5	20-25	55-65
36	180 min.	5 to 7	5-6	30-35	75-85
50	180 min.	3 to 5	dark	10-20	65-75
180	180 min.	15 max.	2-2.5	Nil	Nil
200	190 min.	8 max.	brown	Nil	Nil
500	190 min.	8 max.	2-2.5	Nil	Nil
700	190 min.	4 max.	2-2.5	Nil	Nil
1025	195 min.	2 max.	2-2.5	Nil	Nil
Jet Black	185 min.	11 to 16	black	Nil	Nil
Synthetic 20	210 min.	2 max.	3 max.	—	—
Synthetic 25	210 min.	2 max.	3 max.	—	—



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PW3-54-3

## DISTRIBUTION . . . . .

what he's trying to do until you try it yourself."

• Southwest manager Elmer Elbin, asked to name his biggest benefit from coming to New York: "It gave me an opportunity to learn the inner workings of the home office and to familiarize myself with plasticizer products."

Elbin also admits he learned the value of being specific when firing field queries in to product managers. "We're so inclined in the field to holler before we're hurt," he says; "yet often we don't really give the information the man needs to do a good job."

• Western manager Harry Snell agrees with some of the other district managers' conclusions: "Switching gives you time to understand the head office. Our usual New York sales meetings are so specifically organized that there's no time for a good general view of the situation."

Other advantages he mentions: better picture of plant and product line expansions, and learning (through reading call reports from men throughout the country) of selling techniques

"that might apply in your own area—techniques that might not have occurred to you."

And did the district managers worry about losing customers while they were away from their territories? To some extent all three echo sales manager Stevens' fears that a district could be "snafued" by a substitute.

However, in response to CW's deeper probing, they admit, with characteristic salesman's self-assurance, they are not unduly concerned. As Elbin phrases the situation: "I don't think anybody can mess up my territory in as little as a month. If my district isn't tied down any better than that, it deserves to get messed up."

**Look Ahead:** But immediate sales effects are admittedly secondary to Celanese's future plans.

For, benefiting from the broader and deeper understanding that's bound to grow from "Operation Big Switch," the "switchees," their grasp of today's over-all operations strengthened, are being groomed for the long-pull sales races ahead.



WORKING FOR SALES, young couple mail out circulars in antifreeze training film on . . .

## How to Unfreeze Motorists

"Help the dealer help himself" has long been a sales-enhancing axiom in many a chemical company. Last fortnight, in an effort to help its dealers as well as itself to a greater chunk of antifreeze sales, Commercial Solvents Corp. began distribution of a new service station training film.

Running 21 minutes, the 16-mm., color movie, "Your Moving Targets," educates the operator to the ways of salesmanship, customer relations, and administrative technique. In depicting

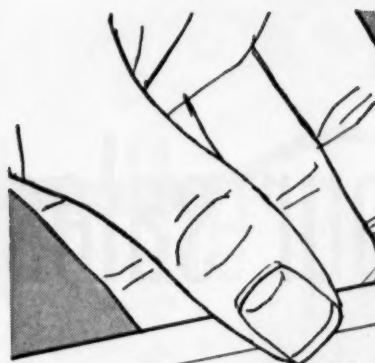
the story of a young gas station owner just launching his business, the film explains to the dealer:

- How antifreeze is manufactured and properly installed in automotive cooling systems.

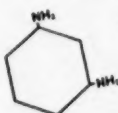
- How to meet such typical sales obstacles as antifreeze reuse and "I-can-buy-it-wholesale."

- How to employ promotional material telling.

Distribution of the film, according to Paul Smith, general manager of



### m-Phenylenediamine\*

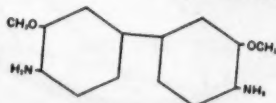


An amber brown solid soluble in alcohol, ether and water. Up to 1.5% of the ortho isomer may be present as impurities. Water insolubles are below 0.2%; ash, below 0.1%.

#### SPECIFICATIONS

Purity: 99.0% min., determined by coupling  
Freezing Point: 62.0°C. min., dry basis

### o-Dianisidine\*

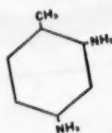


A gray to pinkish gray solid readily soluble in dilute hydrochloric acid. It may contain up to 0.5% ash as an impurity.

#### SPECIFICATIONS

Purity: 98.0% min., as determined by nitrite absorption  
Freezing Point: 136.0°C. min., after drying 2 hrs. in vacuum oven  
Moisture Content: 0.10% max.

### 2,4-Tolylenediamine\*



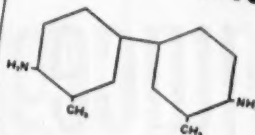
A light tan to brown crystalline solid, very soluble in alcohol, ether and boiling water. It may contain up to 0.1% water insolubles and 0.2% ash as impurities.

#### SPECIFICATIONS

Purity: 99.0% min. by coupling  
Moisture Content: 1.0% max.  
Freezing Point: 97.0°C. min., dry basis

\*These compounds sold in Technical grade.

### o-Tolidine\*



A light tan solid soluble in alcohol, ether and dilute hydrochloric acid. It may contain up to 0.3% ash and traces of insolubles in 10% hydrochloric acid as impurities.

#### SPECIFICATIONS

Purity: 98% min. by nitrite absorption  
Moisture Content: 0.5% max.  
Freezing Point: 128.0°C. min.

## Calling on you for commercial evaluation **DU PONT** **DIAMINES**

Today, Du Pont diamines are being actively investigated for application in industry, both in our laboratories and in those of many firms. Already there are indications that these compounds will prove highly useful as intermediates in a wide variety of chemical reactions.

A free sample of any one of these promising diamines will be sent to you on request for your own evaluation. Just write on company letterhead to: E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Dyes & Chemicals Div., Wilmington 98, Del.



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BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY

**ORGANIC**  
**CHEMICALS DEPARTMENT**



# how to juice up your sales

**Power-gulping?** You said it! Know any field consuming more kilowatts than the Chemical Process Industries?

And what better indicator would you want to size-up a market's appetite for your own goods and services?

**Talk about yardsticks?** The CPI drinks up a quarter of all electricity sold by the utilities, pays the bill for close to half all manufacturing power supply, generates more in its own plants than the rest of industry combined. What's more, consumption's set to double all over again in the next 10 years. The big load's still to come!

**Big load?** That's for sure! More power means automation, new plants, bigger capacities. More raw materials will be handled and processed . . . more conveyors and containers required. More equipment will be needed . . . mixers, motors, instruments, packaging machines . . . *more everything!* And the chemical engineer will keep stepping up demand to push a never-slacking flow of new products from lab to full-scale, low-cost production.

**See for yourself!** Take the market's pulse in the realistic pages of **CHEMICAL ENGINEERING**. Get an idea of the CPI's volatile potentials from its own workbook in . . . *Chemicals Buck The Trend — We'll Need 94% More Power By 1963 — How Much Money For New Facilities?* Then visualize what this constant current of technological activity can do to spark new opportunities for you.

**But don't stop here!** Use the market aids on the opposite page for a starter. Get hold of your CE representative . . . ask him to delineate the live-wire prospects for your product. Set your objectives high. And back your sales team with a solid schedule of low-cost, high-readership advertising . . . in the magazine more buying-powered production men prefer to any other . . . **CHEMICAL ENGINEERING**.



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# to the power-gulping CPI

Write for these CPI planning helps

**RAW MATERIALS:** A 16-page booklet . . . based on a comprehensive study among chemicals salesmen. Covers market size, selling methods, buying influences. Defines the chemical engineer's role in purchasing . . . shows how to appeal to him in your advertising.

**POLLUTION CONTROL:** It's big stuff here . . . threats of water shortage and choking off expansion in the CPI's greatest growth area. And it's opening wide a whopping market in the next 10 years for your equipment, materials and engineering services.

**CORROSION** eats up better than \$8 billion in industry every year. And the CPI's very nature makes it a natural market for protective coatings, construction materials and equipment that stand up under tough operating conditions.

**TRY THESE** for a quick look at some rich CPI territory. For more specifics on demand for your own goods and services . . . write CE's Research Dept. — or call in your CHEMICAL ENGINEERING representative.

more engineering-minded production men read it . . .

more advertisers invest more pages in it . . .

## Chemical Engineering

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## DISTRIBUTION

CSC's Automotive Specialties Dept., will be to automotive trade students, trade associations, and interested dealer organizations.

Although not photographed primarily to educate dealers to the risks of reusing antifreeze, the picture stresses possible costly results of such action. Some companies have found over 30% of dealers in certain areas support reuse.

Sales results racked up by "Your Moving Targets," will be a long time coming in and will be shared with other producers. But, avers CSC, the picture fills a long-open gap in dealer sales training.

#### Distributor appointments:

- Foote Mineral Co., Philadelphia, has obtained exclusive distribution rights to the welding industry for an iron powder, RZ40, a welding electrode coating manufactured by the Easton Metal Powder Co., New York.
- American Gilsonite Co. has selected the Henry Thompson Co. as its Cincinnati area distributor for Gilsulate, a pipe insulator.
- Deere & Co.'s Grand River

Chemical Div. Pryor, Okla. has named R. W. Greeff & Co., Inc., New York, exclusive sales agents for Grand River's line of agriculture and industrial chemicals.

• Du Pont has appointed five distributors across the middle of the country to sell its new vapor degreasing solvent, "Triclene." All members of the Solvents and Chemical Group of Chicago, the distributors will cater to markets in the Buffalo, Detroit, Toledo, Grand Rapids, Houston, and New Orleans areas.

#### For your reference files:

- Price list—Ringwood Chemical Corp. is currently offering a list covering all items of its manufacture.
- Wrapping and Bundling—8-p. brochure outlining wrapping methods, materials, machines, and adhesives. Bulletin 25, Paisley Products, New York.
- Diethyl Malonate—a 33-p. technical data bulletin providing numerous chemical reactions and references, properties, specifications and packaging data. American-British Chemicals, New York.

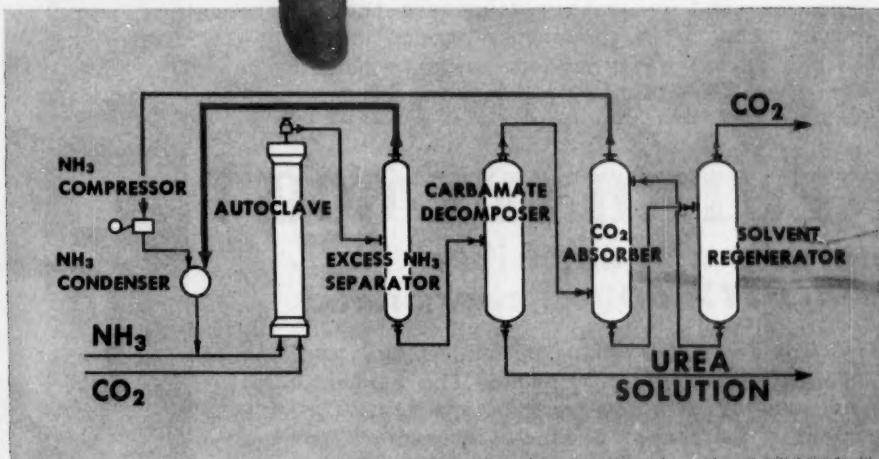


## Lion Bagging at Luling

APPROACHING full ammonia output, Lion Oil Co.'s recently opened (CW, July 3, p. 32) plant at Luling, La., is now producing ammonium nitrate. Built at a cost of \$31 million, the factory will eventually have a capacity 1.2 million lbs./day of ammonia and the nitrate. Watching the first sacks of ammonium nitrate leave the filling line are officials of Lion and the Fulton Bag & Cotton Mills Co., supplier of the packaging: (r. to l.) R. L. Van Zandt, plant superintendent; J. M. Elsas, Fulton's New Orleans manager; L. J. Even, New Orleans sales supervisor for Fulton; W. G. East, plant purchasing agent; and J. F. Greeley, Fulton's Multi-wall Paper Bag Division manager.



# Why these Red Lines?



## WHY THESE RED LINES?

To return excess and recovered ammonia.

## WHY EXCESS AMMONIA?

To obtain a high conversion of carbamate to urea.

## WHY HIGH CONVERSION?

To produce more urea per pass and to reduce the amount of unconverted carbamate which in turn reduces the amount of ammonia to be recovered.

## RESULTS?

Chemico urea plant operating records show an actual conversion of 76% in the presence of 200% excess ammonia, as compared to a theoretically maximum conversion of only 48% when the stoichiometric feed ratio is used.

Write us for the complete details of this Chemico process and further information on its proved economic advantages.



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**CHEMICO** *Urea* process

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# ONYX OIL & CHEMICAL COMPANY

## PROBLEM

**To find an efficient dishwashing detergent that will not inactivate a quaternary rinse**

A large supplier of detergents for dishwashing found that the detergent he was providing for automatic dispensers was inactivating the quaternary used in a sanitizing rinse in the next sink. The unit, which quickly and accurately dispenses the correct amount of detergent along with the proper amount of quaternary in the next sink, is extremely advantageous to use, provided the detergent did not inactivate the quaternary.

## SOLUTION

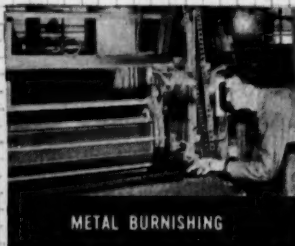
## NEUTRONYX 600

**Efficient detergent and emulsifier, non-ionic NEUTRONYX 600 answers need**

Unexcelled as a detergent for the washing of dishes, glassware and other hard surfaces, NEUTRONYX 600 proved the perfect answer to the problem because of its non-ionic character, together with its superiority to soap. Surfaces washed with NEUTRONYX 600 dry to a brilliant unspotted appearance without toweling. Most important, of course, in addition to its excellent detergent and emulsifying properties, NEUTRONYX 600 does not affect the sanitizing action of quaternary rinses.



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METAL BURNISHING



DISHWASHING COMPOUNDS

One of the most versatile as well as efficient detergents available, NEUTRONYX 600 has an unusually wide range of uses and applications. It serves also as an emulsifier, wetting agent and dispersing agent. Extremely dependable, NEUTRONYX 600 is compatible with acids, alkalis and electrolytes, both cationic and anionic surfactants, is stable at low, medium and elevated temperatures, will not deteriorate in storage, is resistant to hard water and has a low volatility.

Outstanding as it is for its detergency, NEUTRONYX 600 is important, too, for the economy with which it achieves these superior results. This economy carries over into its other uses, which include:

**EMULSIFIER** -- Formulation of DDT, chlordane and lindane; emulsion paints; cosmetics; shampoos; polishing waxes and pastes, etc.

**WETTING AGENT** -- In coal mining; steel pickling; clay and ceramic manufacture; wallpaper removal, and others.

**DISPERSING AGENT** -- For metal polishing; pigments; dispersion of insoluble soaps in hard water.

Complete data on the remarkable properties of NEUTRONYX 600 are available upon request. Write for them today.



EMULSION PAINTS



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ORE FLOTATION



ROSS-MILES FOAM METER

## PROBLEM

**To increase the saleability  
through greater detergency and foaming**

The sales appeal of numerous products today rests on their efficiency as detergents and, because of the demand built up for them, extensive foaming properties. Many items are sold almost solely on the basis of that foaming action, while the more powerful a detergent (within reasonable limits) the greater its appeal.



## SOLUTION

# MAPROFIX POWDER LK

**offers high activity at low cost**

A 92 per cent active detergent and foaming agent, MAPROFIX POWDER LK (sodium lauryl sulphate) is truly unusual for its properties. Its high concentration makes it one of the most potent synthetic detergents available, and it is noted as well for exceptional foaming action -- large volume, high density and extraordinary persistency.

While especially recommended as a foaming agent for dentifrices, shampoos and other cosmetic products, MAPROFIX POWDER LK is also an excellent dispersing agent for insecticides, fungicides and cosmetics and is especially recommended as a carpet cleaning, general household and industrial detergent.

## ONYX -OL 336, 368



ONYX-OL 336 is being used in large volume as a foam builder and stabilizer in one of the most popular liquid household detergents for hand dishwashing. Such compounds generally consist of an alkyl aryl sulfonate, a sulphonated non-ionic and the foam stabilizing agent. ONYX-OL 336, being a lauric acid alkanolamine condensate, is usually used in a ratio of one part to each six parts of anionic detergents.

The versatility of ONYX-OL 336 -- combining together with its excellent wetting, penetrating and dispersing actions and unusual detergent qualities -- makes it a most remarkable product, equally suitable for a wide range of uses from bubble bath compounds to ore flotation.

A companion product, ONYX-OL 368, is a fatty acid mono-alkanolamide, which comes in powdered form. It is ideal for addition to sulphonated detergents where foam stabilization is the primary requirement.

There are a number of other fatty acids to meet every need for foaming action in household detergents, bubble baths, car washing, etc. Write today without obligation.

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DEWEY AND ALMY'S EGAN (left): More freedom is the goal.

## New Faith in the Pro

Faster payoffs, increased creativeness are dual claims behind a timely plan for making the most of research manpower.

How to do it: keep technicians down to a bare minimum; bring your professional men up the hard way.

"Show me the man who knows what he is fighting for," stated a philosophical World War II general officer, "and I'll show you a good soldier." What holds true on the battlefield may well apply, in a slightly different context, to the research laboratory. Operating on the theory that the best researcher is the man with the most knowledge of his science and his company's objectives, Dewey and Almy Chemical Co. this week finds itself bucking a trend, supporting a research staff that probably boasts a higher proportion of professionals than does the research wing of any firm of comparable size.

The Cambridge (Mass.) chemical company employs 105 professional degree-holding researchers and not more than half a dozen technicians directly concerned with research. That's a lopsided ratio under any conditions. But it fairly shouts for attention at a time when most chemical firms are relying more and more on technicians to offset their own shortages of skilled scientific manpower.

It may be an anomaly, yet the Dewey and Almy setup makes simple good sense to Charles Egan, vice-

president for research and development.

"We think that our way of doing things gives a quicker payoff," he says. "What's more, we feel it fosters maximum creativity and productivity. You can give a professional man a lot more freedom than a technician—and freedom is essential to creativeness. With the graduate chemist, you usually can be assured that you're getting a thorough, careful job. He's trained that way and he usually isn't satisfied with less. You cannot take the technician that much for granted."

These views won't bring research executive Egan into conflict with many of his counterparts in other companies. It's the degree to which they are applied that is the bone of contention. Prompted largely by the difficulty of procuring desired scientists, many research directors have tried technicians in a number of unfamiliar roles. To their delight, these harried innovators discovered that technicians could hold down a variety of jobs traditionally performed by professionals.

The typical research director still doesn't want a staff that runs predom-

inantly to subprofessional-grade people. But, in most cases, he has no compunctions about allowing technicians to shoulder a significant share of the work load.

**Other Ideas:** Not so Egan and his trio of assistant research directors. Their theory is that technicians have a place in the laboratory, but only in routine and repetitive work. The scant handful of Dewey and Almy research technicians do control testing and pilot-plant work, only the most routine research tasks. Strictly speaking, about 40 additional staffers in the company's research and development division could be classed as technicians; but they are considerably removed from research, operate and fabricate the heavy application machinery for testing the company's line of adhesives, container sealing compounds, packaging films and textile printing blankets.

Full-fledged degree-holding scientists and technologists do all the research worthy of that label. That includes everything from polymer synthesis to such prosaic assignments as compounding of can sealing compound formulations. This may seem to be a waste of brainpower and a decidedly uneconomic way to utilize well-paid scientific talent.

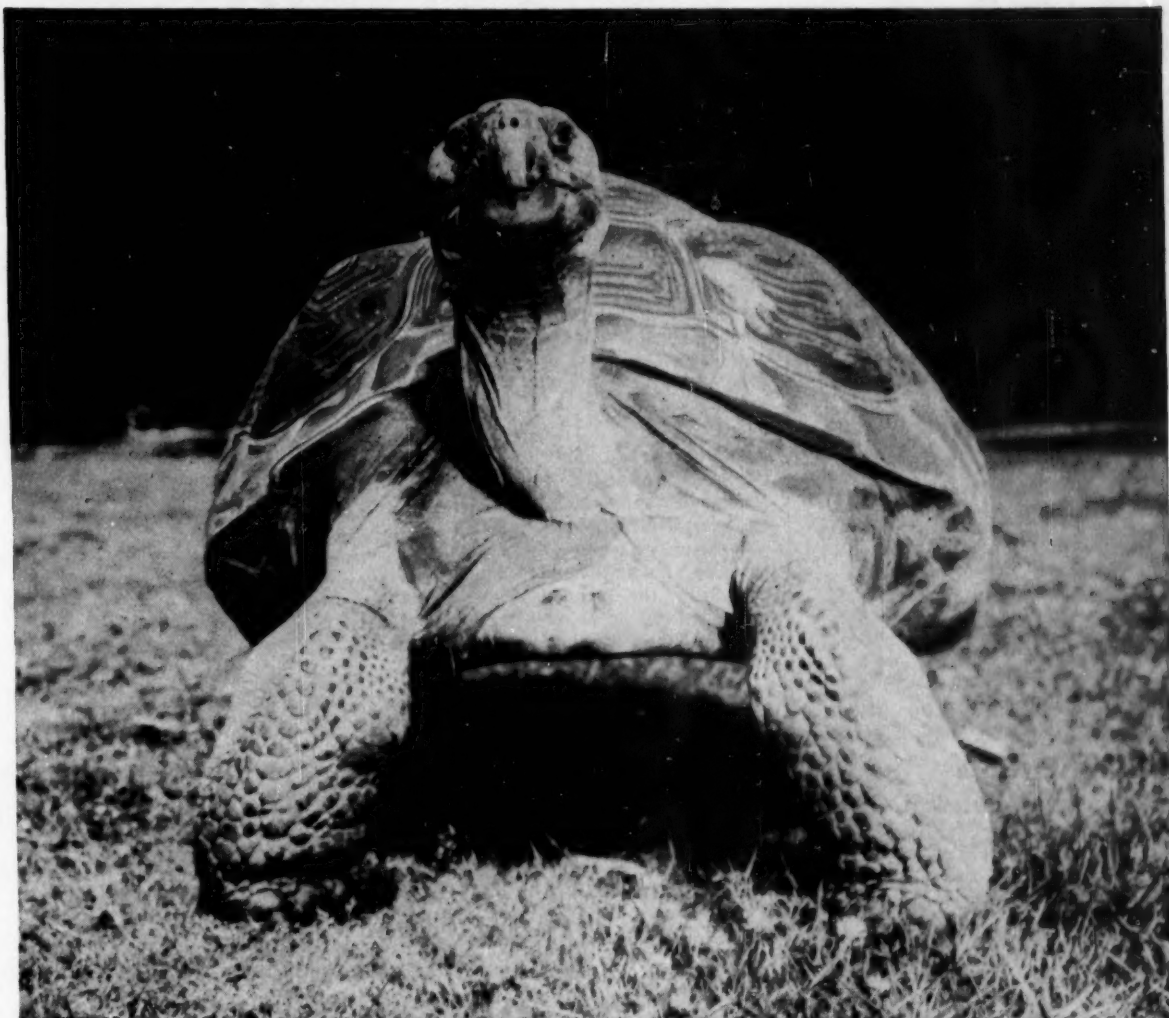
Egan, however, doesn't see it that way. "What we are doing," he emphasizes, "is developing the kind of people we must have to make a success of our business. Ours is a prescription business. We listen to what a customer is trying to accomplish, go out and size up his problem, then try to solve it by developing a product that will do a job for him."

"Every job is a special assignment that calls for a specialist. We just don't have many openings for technicians. When we start a man at the bottom of the ladder in some field, then make him work his way up, we are developing an expert who knows his special subject from start to finish. At the group leader level, he's the individual with sole responsibility for a product or a line of products."

And that, according to Egan, is desirable for reasons other than sheer technical proficiency. In his estimate, it:

- Permits closer coordination of research, manufacturing and sales. The researcher with a thorough understanding of how a product is made and used speaks the language of sales and production people. As a result, Egan relates, Dewey and Almy research men enjoy an unusual amount of freedom in their relationship with the plant and

## The Industries We Serve—INDUSTRIAL MAINTENANCE



### And I thought I had long-lasting protection

Sorry Mr. T. but the coal chemicals industry has you licked by a country mile when it comes to protection. Durable coatings from coal are on duty 24 hours a day, fighting sunshine, moisture, chemicals and a dozen other corrosive culprits that cost America \$5 billion a year.

One of our toughest battles is to protect the nation's vital underground steel pipeline system that carries gas and petroleum products to every corner of the U. S. As a basic producer of coal-derived products, Pittsburgh Coke & Chemical is a leading supplier of tar base pipeline enamels. These rugged, impervious "skins" of Pitt Chem enamel protect many of the nation's "big inch" lines from fast death underground.

Pitt Chem cold applied tar base enamels and synthetic resin coatings are in the fight too, helping industry to protect its large investment in

processing equipment, sewage treatment plants, rail and marine equipment and scores of other places.

Versatile Pitt Chem coatings, like all other products of our ten integrated divisions, are quality-controlled from coal to final processing: *better* products for industry and agriculture because Pittsburgh is *basic*.



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KLEER®**...

**a type  
for every  
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## RESEARCH . . . . .

sales. And this, in turn, promotes a team effort on any given problem.

- Allows extremely close contact with customers' problems. Dewey and Almy research people often deal directly with customers (always with the knowledge of the sales department), get information and ideas first hand. In this way, chances of falsely sizing up a problem are reduced.

- Assures a steady flow of promotable personnel for management posts in research and other divisions of the company. The present vice-president in charge of sales, for example, received his early training in research.

- Eliminates friction-causing competition between professionals and nonprofessionals. This sort of thing, declares Egan, has become an extremely troublesome internal sore spot in several firms that maintain a high proportion of technicians. Despite his usually insurmountable educational handicap, the technician often feels resentful when he sees professional bench-fellows get ahead in the firm.

**Works Both Ways:** On the other hand there's cause for trepidation over the professional's reaction to being as-

signed comparatively menial chores. This potential problem is largely mitigated by the clear opportunity for advancement. A growing concern, Dewey and Almy has undergone marked expansion in recent years, today spends four times as much for research as it did a decade ago. In cold cash, that's an outlay of something over \$1.5 million/year, or 4-5% of sales.

A good researcher soon gets the chance to rise above his first humble station; he need not wait for someone to die or move up ahead of him.

Company researchers don't seem to chafe under the system. Egan can proudly point to a very low rate of turnover—four men in the past year.

All told, the low ratio of technicians works well for Dewey and Almy. But it's not necessarily good for everyone else. Operating under different demands and in a less favorable location for procuring young scientific help, many research directors may have a different outlook on the best balance. But in a field where a good idea is the one that gives results, the Cambridge chemical company's plan demands recognition.



## Peroxide Booster

**HOPPING OFF** with a 750-lb. extra burden (in basket below 'copter in foreground), a specially fitted Marine helicopter shows off power of its new hydrogen peroxide rocket engines made by Reaction Motors, Inc. (Rockaway, N.J.).

The tip-mounted engines (weighing only about a pound apiece) contain an undisclosed catalyst that decomposes the hydrogen per-

oxide with explosive force. The entire setup—three tip engines, and a fuel supply (mounted in dome over rotor hub)—weighs only 67 lbs., can deliver a 120-hp. boost.

Units are operated simply by the pilot's pushing a button, holding it down as long as he needs power (up to 6-minute limit). The installation, shown on a Sikorsky HRS-2, is still in research.





West End Chemical Company plant at Searles Lake in the California desert operates 24 hours a day, 365 days a year.

## Marks 30th year as source of highest quality soda ash for western industry

Since 1924, West End Chemical Company soda ash has been produced in the West to meet western industry's requirements. From the site of the world's largest natural brine deposits in the California desert, West End provides the most rapid and economical shipment of soda ash available to users throughout the West. Requirements of western users always take priority.

West End has kept pace with the West's rapid growth by consistently expanding its production and service facilities in anticipation of increased requirements.

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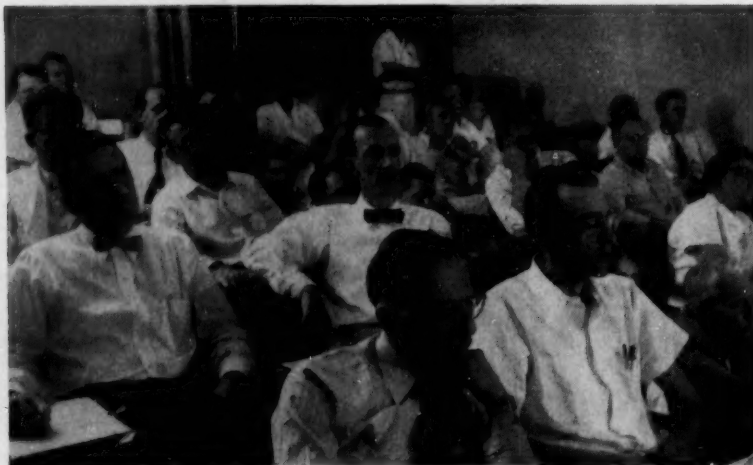
Immediate shipment to customers throughout the West in company's own leased hopper cars . . . ready at all times.



30 minutes in-and-out loading for bulk trucks at any hour of day or night through "serve yourself" delivery.

Executive offices: 608 Latham Square Building, Oakland 12, California • Plant: Westend, California

October 2, 1954 • Chemical Week



AUSTRALIA'S BIRCH (top): For visiting firemen, a chance to swap ideas.

## Company Chemistry Lesson

*It's an increasingly popular way to help industrial researchers keep abreast of new scientific advances. Here's an inside look at an effective, time-tried company seminar program.*

Like most cities of comparable size, Kalamazoo (population, about 60,000) does not have the reputation of being a nerve center for science. Yet this week, this typical southern Michigan community will welcome the newest member of a string of more than 200 world-famous scientists who have come to Kalamazoo during the past eight years.

The attraction for this distinguished procession is the chance to hold forth at one of The Upjohn Co.'s fruitful Research-Medical Seminars. Bearing a

slightly misleading name—the subject program is heavy on chemistry, microbiology, scientific skills, very light on medicine—the lively seminars are popular with company researchers and visiting speakers alike.

They permit the former to get firsthand instruction on the developments that are broadening the scope of their science. The latter receive an unaccustomed glimpse of the applied industrial research that is putting their discoveries to practical use in the development of new drugs. Moreover, they get

a chance to exchange ideas with company researchers, many of whom have distinguished reputations of their own.

One of the largest of such programs in the chemical process industries, the Upjohn seminars are worthwhile from management's standpoint, as well:

- They foster a healthy active interest in the fundamental scientific advances that form the basis of pharmaceutical research progress.
- A lucid presentation of a topic by an authority can often accomplish more in a couple of hours than does several days' poring over the literature.
- Morale receives a strong boost as a result of researchers' personal contact with the people they may have previously known only as imposing and impersonal names on scientific papers. And the presence of visiting professors creates a kind of university atmosphere that many research people enjoy.

Sensitive to these factors, company management has encouraged the seminar program. But its actual supervision and execution is completely in the hands of researchers. It's a lot of work, entails the selection of speakers, correspondence to set a date, travel arrangements and a number of miscellaneous tasks. "Visiting firemen" come from all parts of the free world.

Anyone in the company may suggest a speaker candidate by submitting his qualifications to a rotating three-man interdepartmental seminar committee composed this year of Arnold Ott (chemistry), Harold Reames (clinical research) and George Savage (antibiotics). The committee selects speakers by their professional qualifications, pertinence of their subject and the demands of the schedule.

To achieve balance the committee strives to line up a chemist, biologist and medical man for each month's program. The bulk of the program is formalized early; next year's schedule, for example, is now being put on a firm footing.

When the seminar system was inaugurated back in 1946, the year's list was made up of only nine meetings. Since then, however, the research staff has warmed considerably to the idea. Today the seminar committee gets more speaker suggestions than it could possibly accommodate.

When a speaking candidate is chosen, his visit is arranged by the individual who suggested him. The staffer provides for hotel reservations, expenses, entertainment and an honorarium (\$100). Some of these details can become rather complicated when your man is coming from Australia. Such a visitor probably does not come

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**RESEARCH . . . . .**



**PATON (left) AND GATES:** An unaccustomed look at industry.

all the way just for the seminar, usually is invited when he plans to be in this country.

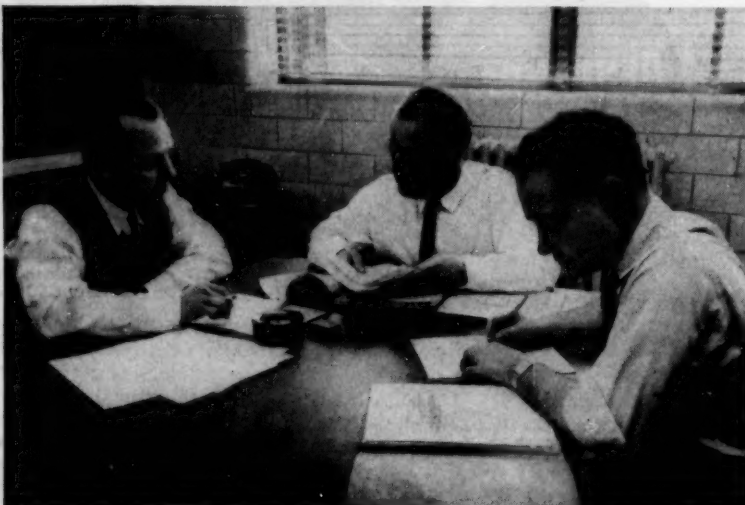
Perhaps the most important duty of the sponsor is to introduce his man to those researchers in the company who are most interested in the visitor's work. The sponsor also conducts a tour of the company's plant and research laboratories.

Among seminar speakers have been such renowned authorities as Professor Arthur J. Birch, of the University of Sydney, Australia; W. D. M. Paton, pharmacologist of London's Royal College of Surgeons; and Professor A. J. Kluyver, of the Technical University at Delft, Holland. Many prominent Americans (such as University of Rochester chemist, Marshall Gates) also have appeared.

The program's most recent guest: J. W. Cronforth, of the National Research Council, London, England.

Like the aforementioned individuals, most speakers are drawn from the realm of pure fundamental research. But seminar discussions are not rigidly limited to academic topics. Included among last year's 44 seminars were such "how-to-do-its" as improvement of technical writing and improvement of manufacturing operations. The latter was chiefly for outlook-broadening purposes.

Well received, the seminars usually are packed, even though most are held after regular working hours. A two-way proposition, Upjohn researchers aren't passing up a valuable chance for self-improvement at company expense.



**PLANNERS REAMES, OTT AND SAVAGE (l. to r.):** They strive for balance.

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Oil adsorption . . . . . 240 lbs. oil/100 lbs.  $\text{SiO}_2$

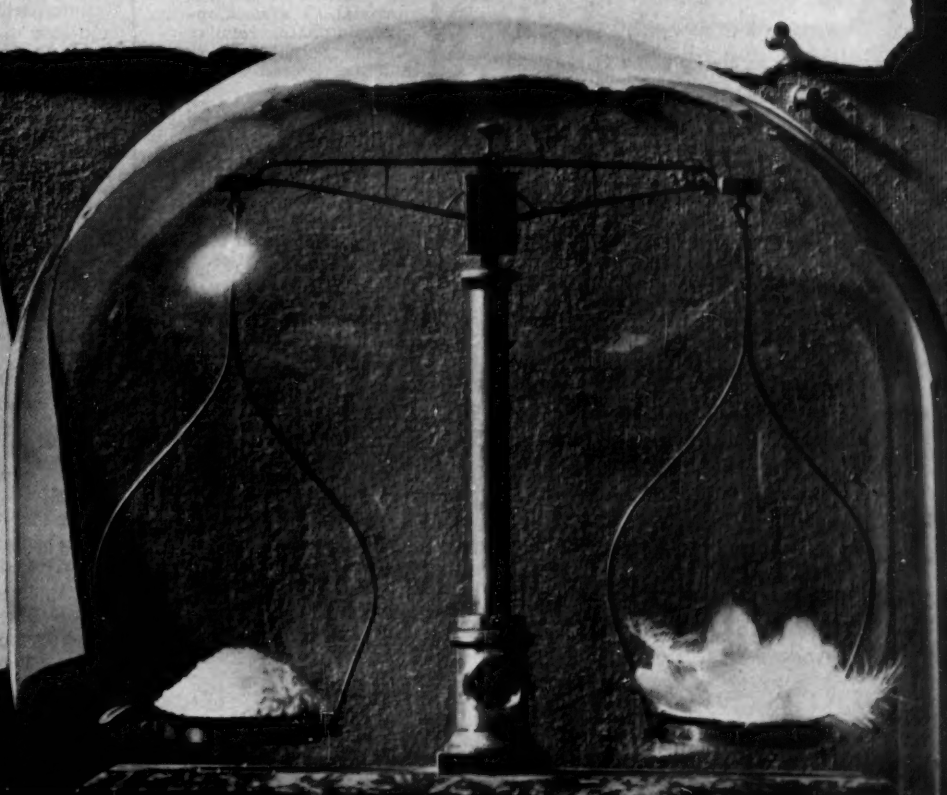
Surface area (nitrogen) . . . . . 292  $\text{M}_2$ /gram

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20	2.0
40	3.0
50	3.7
60	4.5
80	7.0

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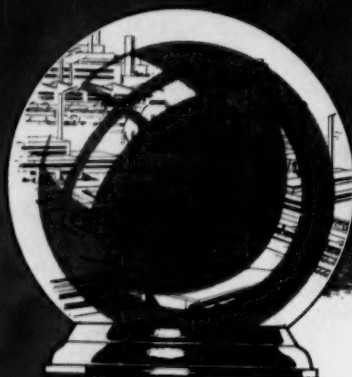
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## RESEARCH . . . . .

### New Contenders

Five new chemical products were launched into commercial competition this week:

- Ethylenediamine tetraacetonitrile (EDTN), a cream-colored powder joins the ranks of job-seeking new intermediates. Produced by Glyco Products Co. (Brooklyn, N.Y.), EDTN is riding a reactive chemical nature. The compound undergoes typical nitrile reactions, forms polyamino derivatives, joins with alcohols to yield long-chain esters, and takes part in quaternization reactions. Moreover, Glyco states, new compounds may be formed by reduction of EDTN or subjecting it to Friedel-Craft reactions. Available at \$1/lb., the chemical is rated at better than 95% purity.

- Control engineers have a potential helpmeet in Eastman Kodak's new lead sulfide heat-sensing cells. Said to possess extremely high sensitivity to near-infrared radiation, the new cells—little slips of glass coated with lead sulfide—might qualify as sensing elements in automatic control systems. Compactness and sensitivity would be strong points in favor of a hopeful infrared control device—e.g., one that could monitor the composition of process fluids on the basis of their characteristic infrared spectra.

- High hopes for a new oil-extended synthetic rubber are held out by Fritz Rostler, research director of Golden Bear Oil Co. (Los Angeles). Reportedly superior to oil-containing counterparts in strength, toughness and ease of fabrication, the new synthetic is also said to be far less costly to fabricate. According to Rostler, it's much more pliable in the raw stage than other synthetics, sharply reduces power requirements of fabricating machinery. Secret of the soft rubber is a heat treatment of the coagulated latex formed during its manufacture. But the new product also employs a special blend of three oils introduced in the latex stage.

- Isotopes are behind the news from Nuclear Instrument and Chemical Corp. (Chicago). They're the labels on three new radio-actively tagged carbohydrates that are destined for application in tracer probes of nutrition, fermentation and photosynthesis. Obtainable under regular AEC licensing procedures, the hot sugars are D-glucose, D-glucono- $\Delta$ -lactone, and D-mannose. All are labeled with carbon-14 in their No. 1 positions.

- Analysts should find comfort in a time- and trouble-saving new offering by Laboratory Reagents, Inc. (Kansas City, Mo.). The functional



# THE PERKIN-ELMER INSTRUMENT DIGEST

A condensation of some articles in the Summer issue of THE PERKIN-ELMER INSTRUMENT NEWS, a publication of The Perkin-Elmer Corporation, manufacturers of scientific instruments—Infrared Spectrometers, Tiselius Electrophoresis Apparatus, Monochromators, Flame Photometers, Continuous Infra-

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For further information, write The Perkin-Elmer Corp., Norwalk, Conn. Regional Offices: New Orleans, Chicago and Washington, D. C.

Norwalk, Conn.

October, 1954

Vol. 5, No. 4



*Automatic Multi-component Analyzer for automatic analysis of 10-component mixtures in the lab, among the new spectrometers developed from building blocks.*

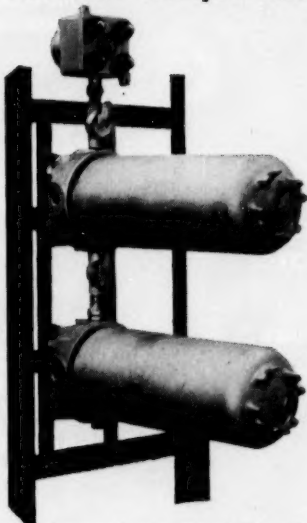
## DO IT YOURSELF... WITH BUILDING BLOCKS

A little over two years ago the "Building Block" concept of instrument design was announced by Perkin-Elmer. Since that time, the number of optical and electronic instrument components available from Perkin-Elmer for all types of radiation instruments has greatly increased. A complete listing of these components, plus descriptions of some standard types of instruments that have been constructed from building blocks, is found in the Summer 1954 issue of INSTRUMENT NEWS.

**The Concept**—Under the "Building Block" concept, basic functional parts of an instrument such as source, monochromator, detector, amplifier, etc., are designed as separate units which may be attached in various combinations. Thus, a wide range of instruments for specific applications may be assembled from a few standard components. For example, with standard Perkin-Elmer parts it is possible to construct such instruments as universal spectrometers covering the visible, ultraviolet and infrared regions; microspectrophotometers for the same regions; high resolution, grating spectrometers; and many other instruments which utilize monochromatic radiation. Where necessary, special components can be developed to complete a particular instrument.

Among the standard items constructed from building blocks are all-wavelength spectrometers, a new Raman Spectrometer, the automatic Multi-component Analyzer, and a Rapid Scan Monochromator.

### TRI-NON® Analyzer Aids Ethylene Production



*Rack-mounted TRI-NON fits directly on process line. Unit is explosion proof.*

Ethylene is becoming an increasingly important raw material in organic chemical processing. And in the production, purification and utilization of this material, process stream control by means of infrared analyzers is also becoming increasingly widespread.

In the Spring 1954 issue of INSTRUMENT NEWS four different types of process stream problems involving ethylene production are presented and their solution, with the aid of TRI-NON Analyzers, is outlined. These problems include: determining ethylene content in feed gas; determining ethylene purity in purification process; determining ethylene concentration on 8 different streams; determining ethylene content in an ethylene glycol plant stream.

These are the type of problems for which Perkin-Elmer's Application Engineering Laboratory is equipped to find the solution. If you have a processing problem, it will pay you to write Perkin-Elmer to determine how infrared analyzers may be applied in your plant.

### Rapid Scan Monochromator Developed with Building Blocks

One of the most novel of the new building block instruments is the Model 108 Rapid Scan Monochromator. The first unit was built for the Army Chemical Center to assist in the study of various types of combustion. Studies of reaction rates, the formation of intermediates and other kinetic problems may also be handled by the new instrument. Any portion of the spectrum may be observed at will. Scan frequency is continuously adjustable from 2 to 125 cycles per second. Photographic accessories for permanently recording the spectra can also be provided.

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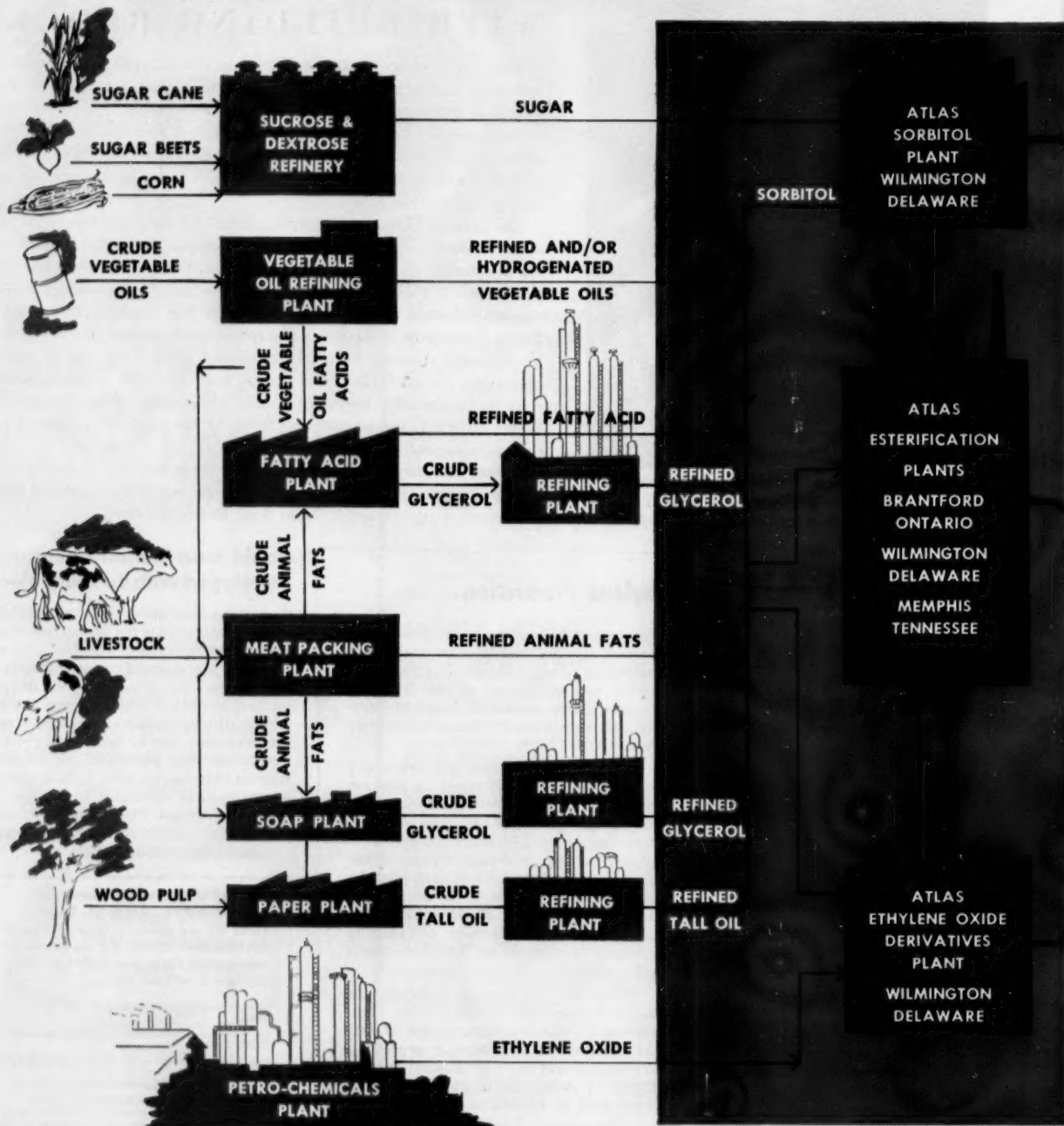
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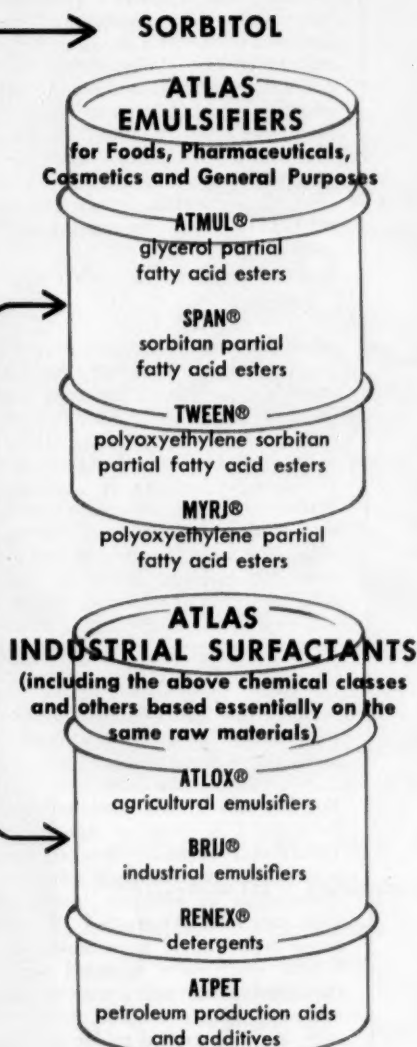
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Using such raw materials as sorbitol, glycerol, fatty acids, tall oil, vegetable oils, and ethylene oxide, Atlas produces several hundred surface active agents. These encompass a broad variety of detergents, emulsifiers, penetrants and solubilizing agents. Their uses extend into bakery products, ice cream, confections, textiles, cleaning compounds, agricultural chemicals, paints and petroleum products.

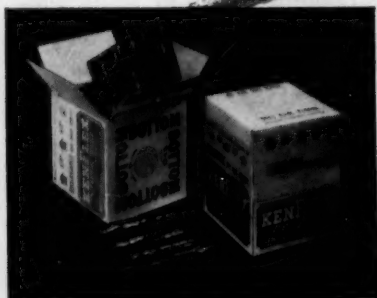
Atlas chemists will be glad to cooperate with you in developing effective ways to use these versatile materials in the products which you're making. Write today for detailed literature or technical assistance on your specific application.





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## RESEARCH . . . . .

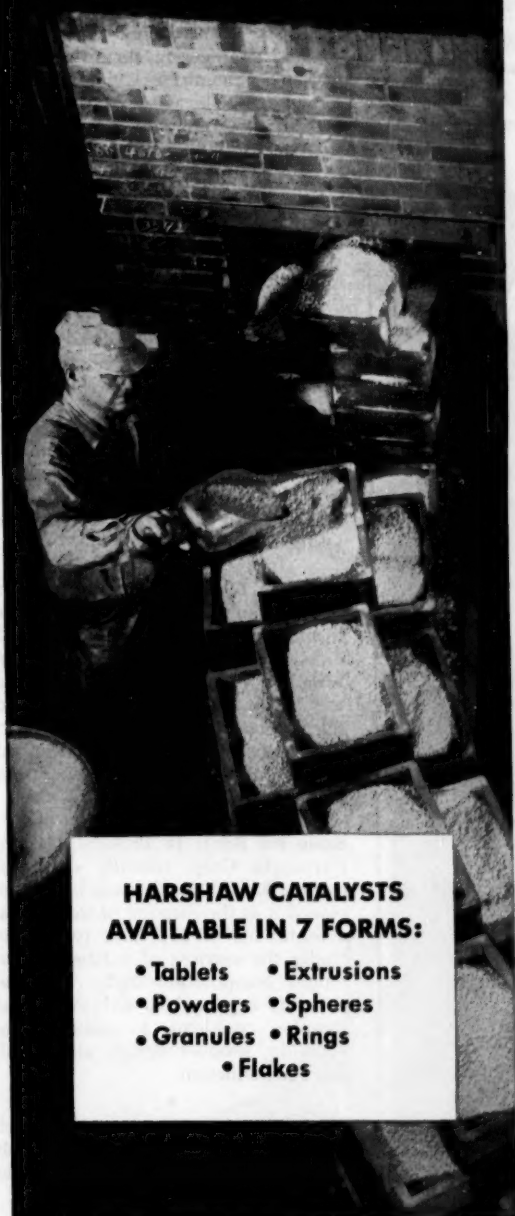
new product is a mixture of reagents used in Kjeldahl nitrogen determinations. Accurately weighed out and blended, the chemicals are packaged in a handy polyethylene container that goes into the flask with its contents. The package is stated to have no effect on the accuracy of the analysis. On the other hand, claims the company, it definitely and measurably reduces foaming. Sold under the Kel-Pak trade-name, the packaged powders come in three standard formulas for determinations by the Kjeldahl method and its popular modifications.

**Epoxy Boost:** U.S. patents 2,458,454 (process of preparing epoxy derivatives from unsaturated aliphatic compounds) and 2,559,177 (plasticized polyvinyl resin compositions) have just been released for licensing by General Mills, Inc. (Minneapolis) to encourage research on epoxidation in the plasticizer field. At present, epoxidized fatty acid esters, produced by a half-dozen firms, are finding major use as vinyl chloride plasticizers and stabilizers. General Mills supplies soybean oil fatty acids, cornerstone of several commercial epoxy plasticizers and focus of substantial research interest in this field.

**After the Facts:** A research project for the stated purpose of providing "readily accessible uniform data on the physical properties of chemical compounds," proposed some months ago (*CW*, June 12, p. 11), has been set up at Carnegie Institute of Technology (Pittsburgh, Pa.) under the sponsorship of the Manufacturing Chemists' Assn. The ambitious project will start with high-tonnage industrial chemicals, later expand to include a host of organics and inorganics. Frederick Rossini, Carnegie Tech's chemistry department head, will direct the work. He guides the progress of the comparable American Petroleum Institute project 44, "Data on Hydrocarbons and Related Compounds."

**Bug Fighters:** Newly disclosed results from the U.S. Dept. of Agriculture's agricultural research service (Anaheim, Calif.) peg certain N-substituted formamides as effective insecticides and miticides. Thirty-two of these compounds (made from amines and formic acid) were screened against the armyworm, bean weevil, large milkweed bug, pea aphid, citrus red mite, and two-spotted spider mite. No specific formamide was found effective against all the varieties of test insects, but N,N-dibutylformamide and N,N-dipentylformamide gave a 100% kill (at 5% concentration) of

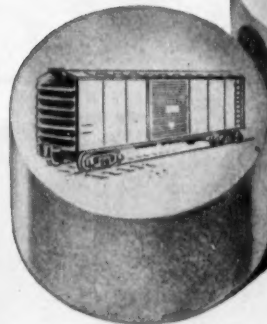
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## RESEARCH . . . . .

three species of insect and one mite.

**Fall Confab:** Metals Division of the Special Libraries Assn. has scheduled a meeting in Chicago for November 3-5. A quintet of papers of interest to metallurgical research librarians will be presented at the Conrad Hilton hotel on Nov. 4; the remaining dates will be occupied by field trips.

**Clay Center:** Three sites near Chicago are under consideration as a location for a planned new national research center to be built by the Structural Clay Products Research Foundation. The proposed building will be on a 10-acre tract and will house the foundation's general offices, drafting rooms, engineering department, and ceramic laboratories now located in downtown Chicago. Since its inception in 1950, this trade association has spent \$1.5 million on brick and tile research.

**Mind Matter:** A new synthesis for serotonin (5-hydroxytryptamine) and its derivatives—of potential value in the search for new drugs to counter mental ailments—has been developed at the Upjohn Co. (Kalamazoo, Mich.). Said to be a simple three-step process, the synthesis uses indole and indole derivatives as the starting material. According to Merrill Speeter, head of Upjohn's department of biochemistry, it is the first time that one of the products, bufotenin, has been made available for studies by qualified investigators.

**Selenium Source:** Commercial recovery of selenium (important in the electronics industry) from iron sulfide ores is the aim of England's United Kingdom Chemical Research Laboratory. The potential new source of selenium comprises the wastes, dusts, and muds obtained when iron sulfide is roasted in sulfuric acid production.

**Brain for Rent:** In Philadelphia, the Burroughs Corp. recently dedicated its new \$250,000 electronic computer, placed it at the disposal of industry at a rental fee of \$75/hour (which includes the services of a 10-man Burroughs computation staff). The machine is expected to aid in solving complex problems in management planning, product design, data analysis and reduction.

**Bid Approved:** Armour Research Foundation (Chicago) reports that its application for a nuclear reactor has just been approved by AEC.



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**INDOIL CHEMICAL COMPANY**  
910 S. Michigan Ave., Chicago 80, Illinois



WOODSMEN'S FILTER: Cup of water in half a minute with help of ionic silver.

## Silver Wants the Job

Sometimes overpromoted, sometimes underestimated, silver renews its challenge to established sanitizers.

Little more than a year ago, readers of one of the mass circulation consumer weeklies were treated to a handsomely illustrated article titled "Is Germfree Living Next?"\* Colorfully written, it recounted how a special form of silver could sterilize an almost endless list of products with virtual permanence. "Tests indicate it will kill more germs than any of the wonder drugs," it effused. "Articles will stay sterile throughout normal use."

Specifically, the article dealt with a product known as Permachem—made by Permachem Corp. (then in New York). It was, at the time, vying most strongly for publicity with another silver sterilizing compound called Movidyn (U.S. Movidyn Corp., Chicago), which had received some attention from food packing journals.

But that was a year ago. What has since happened to those products? Where are the companies? Where does silver stand now as a sterilizing agent? What did all that glamor-fraught publicity achieve?

**Bluster's Victim:** Clearly, the year has wrought vast changes. Permachem, for example, now positively

shuns publicity. It has moved out of New York, is now located in West Palm Beach, Fla. It has been completely reorganized. Its product has not apparently been commercially applied to many of the jobs it was touted to be suitable for.

Movidyn, too, has begun to shun publicity. And similarly, it has undergone extensive reorganization. A pair of Movidyn products, though, has begun to sell—Algaedyn, a swimming pool algae treatment, and Slimodyn, a slime control for the pulp and paper industry.

On the other hand, obscured by the fame these two garnered, another pair of products seems to have come up although they are being more cautiously promoted. They are the Katadyn water treatment (made by American Katadyn Corp., Stamford, Conn.) and more recently, Hyla water treatment (Salem-Brosius, Inc., Pittsburgh).

**More Than Testimonials:** The varying fortunes of some silver-for-sterilizing firms, however, has obscured the obvious merit of silver in sterilizing applications. Overlooking, for a time, the specialties applications—which might put it in many of the fields taken by

disinfectants like the quarternaries—here are some of its advantages as a water sterilant, as claimed by its backers:

- It is odorless, tasteless, colorless, nonirritating, noncorrosive.
- There's no danger of overdosage.
- It boasts a long period of residual bacteria kill.

Naturally, with these qualities, it could aim for many of the jobs now done by chlorine. But chlorine as a disinfectant is firmly entrenched in this nation (in Europe, however, silver's been used for municipal water treatment, and for swimming pool water treatment for over 20 years) and manufacturers of chlorine disinfectants express serious doubt about many of the silver claims.

"Silver has a way of popping up about every 10 years," a manufacturer of chlorinating equipment told CW. "Usually," he said, "there's no data offered, just testimonials—a sauerkraut maker in Bavaria says he couldn't get along without it."

But American Katadyn, Salem-Brosius, and U.S. Movidyn are offering more than testimonials. With more knowledge of silver's limitations now, as well as of its advantages, they've started selling to U.S. industry. But they still have a tough job on their hands.

**Sterilizing Rinse:** Trying to sell municipalities, for instance, has been virtually abandoned. Now, all the firms are concentrating on groups such as food packers. One of the suggested uses might well offer some competition for some of the chlorinated phenols: the treated water, when used to rinse fresh vegetables and fruits, kills surface bacteria and fungus, and permits the foods to be stored longer before processing or cooking.

Similarly, ice made with silver-purified water has been claimed to lengthen the time fish or meat packed in it will remain fresh.

An ingenious specialty job for the silver is in the portable unit sold by American Katadyn (*see cut*). An easily toted device, it gives outdoorsmen a safe supply of water—just as long as there is fresh (not salt) water to be had. The unit, weighing about a pound, will turn out a gallon of water in five minutes. Its price is rather steep though—\$25.

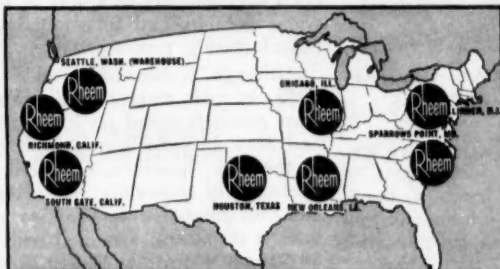
**Offerings Rundown:** It's the larger equipment that the firms are emphasizing most. Here's a rundown of the companies and what they have to offer now:

- Salem-Brosius: Newest entry with its Hyla division, Salem-Brosius is best

\* *Colliers*, Aug. 21, 1953, p. 84.

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Rheem Fibre Drums are being manufactured in four of these plants. Production lines are scheduled for installation in other plants soon.

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Rheem can furnish on Fibre drums the same type of decorative service it provides users of Rheem-cote lithographed steel drums. Any design or trade-mark can be reproduced on an all-over label for Fibre drums in any number of colors to provide "family" identification for your products.

55-gal. Rheemcote Steel Drum

## RHEEM ANNOUNCES A COMPLETE LINE OF FIBRE DRUMS TO SUPPLEMENT ITS STEEL SHIPPING AND EQUIPMENT CONTAINER LINES

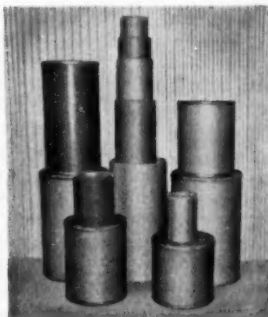
To supplement its line of steel shipping and custom equipment containers, Rheem has added a complete line of Fibre and Fibre-Metal drums. These strong, lightweight, inexpensive drums come in four types and in a wide range of sizes.

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Choose the type that best fits your needs—All-Fibre drums, or Fibre-Metal drums with either slip or friction covers or with the new, easy to install and remove Rheem-Lox ring. Only Rheem offers all these types of low-cost containers.

## Choose the Size that Fits Your Needs



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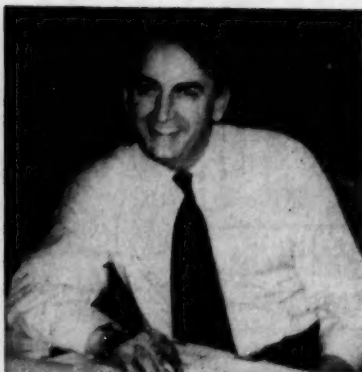
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NOW, MORE THAN EVER BEFORE, YOU CAN RELY ON  
FOR ALL YOUR SHIPPING CONTAINER REQUIREMENTS







McMASTERS AND MOEDLHAMMER: It's Salem-Brosius against American Katadyn, but they're both for silver.

known for its work in industrial furnace design and manufacture. Probably, too, it has more financial backing than any of the other firms that have tried to sell silver to industry for its purifying properties. Currently, Salem-Brosius has the inventor of the process setting up production facilities at a plant in Carnegie, a suburb of Pittsburgh. He is Karl Hofer of Geneva, Switzerland.

According to Joseph McMasters, heading up Hyla, three years of research and experimentation at Johns Hopkins University backs up the company's entry in the oligodynamic disinfection business. This work, he feels, has been the most rigorous and basic done on the idea so far.

Some of the conclusions reached at Johns Hopkins are worth noting:

- Silver apparently reacts only with bacteria that produce sulfur-containing enzymes.

- Silver has its limitations: it will not act in saline, acidic or oxygen-free waters, or in waters containing sulfides or high concentrations of ammonia.

Renn also worked out a way to measure traces—down to 1-10 parts per billion—of silver in water. This has given him a means to reliably apply and control silver use.

The Hyla material is made by forming a thin film of mixed silver oxide and silver peroxide on the surface of evenly sized, activated carbon granules. Water is given about five minutes of contact with the silver—the effluent contains about eight parts per billion total silver. (For human consumption, the maximum safe limit specified by the U.S. Public Health Service is less than one part silver per million.)

Because it regards its process as a technique, rather than a piece of equipment, Hyla prefers to design equipment for specific applications. At

present, a number of companies are testing engineered installations—Salem-Brosius won't pinpoint them other than to say they are some of the largest in the food and beverage industries.

- American Katadyn: A Swiss-developed firm, Katadyn has perhaps the longest history of success in use of silver for disinfecting. It traces its lineage back to before the turn of the century when a Swiss chemist named Naegeli discovered the destructive effect on plant cells of certain metal ions. He termed the phenomenon oligodynamic (power of the smallest unit).

Naegeli's discovery was put to use—a method of electrically ionizing silver in a ceramic device called a "candle" was worked out. By World War II, it was in fairly common use in Europe, for treatment of city water supplies, swimming pool water, and for water-sterilization in the beer, wine and soft drink industries.

In 1950, Spacarb, Inc. (Stamford, Conn.), a manufacturer of automatic drink vending machines, acquired exclusive sales and licensing manufacturing rights for the U.S., Canada and Mexico. It sells two basic types of apparatus here.

One is the Katadyn filter, with a cartridge made of diatomaceous earth with the silver elements within the hollow cartridge (price \$52.50). It both filters and purifies up to 30,000 gal. (the junior unit shown is of this type).

For larger water supplies, another type is offered (\$542) with silver electrodes that can be charged with a low-voltage direct current. Whereas the filter "candle" turns out 25-30 gal./hour maximum, the Electro-Katadyn handles 8 gal./minute, will treat up to 3,580,000 gal. total. The electrode type can be used in groups.

In this country, much of the basic testing of Katadyn has been done by

W. L. Mallmann, professor of bacteriology and public health at Michigan State College, according to Franz Moedlhammer, director-consultant of American Katadyn.

- U.S. Movidyn: Selling a disinfectant product, rather than a process, is U.S. Movidyn. The product, Movidyn, is a stable colloidal solution of activated silver particles in a protective medium. The basic process of making it was worked out in Czechoslovakia in 1946, where it was developed commercially as a way to make water potable, and for sanitizing in manufacturing processes.

Although it has been sold since 1952, its main market is still abroad. Two products based on it, Algaedyn and Slimodyn, do have sizable sales in the U.S., however. Algaedyn, for treatment of swimming pool algae, is less concentrated than Movidyn, contains a dispersing agent. It sells for \$6.50/gal. (Movidyn is \$10.70/qt.), enough to treat 50,000 gal. of water. Slimodyn is a composition of Movidyn and an organo-mercurial in a liquid carrier. It sells for \$1.90/gal., is used for slime control in paper and pulp production.

- Permachem Corp.: Organized to promote a complex organo-silver compound developed in part by Frank Fessler, it was touted at first to have a number of chemical specialty uses, was suggested for inclusion in floor wax, plastics, cement—even tooth-powder and soap.

So far as is known, however, none of these products reached the commercial market. Pennsylvania General Paper Corp. expressed eagerness to try Permachem in its paper towels, but because of a misunderstanding eventually turned to a quarternary as a sanitizer.

Just what is happening with Permachem now, the firm's president is unwilling to say. His only comment is a guarded "We may have a story in a few months."

One thing needed to help all these manufacturers: clarification of the government's position on silver as a germicide. For example, the FDA has yet to set maximum residue limits on its use in food processing or as a sterilizer for bottles and containers.

Thus stands the silver-for-sterilizing situation now. Zealously promoted, sometimes insufficiently backed (with money or research data), it has realized little success in this country. The attempts to push it as a gimmick have failed. The hope of its backers now is that sober, cautious development can turn it into a profit maker.

\* Project was done under the direction of Charles Renn, professor of sanitary engineering.

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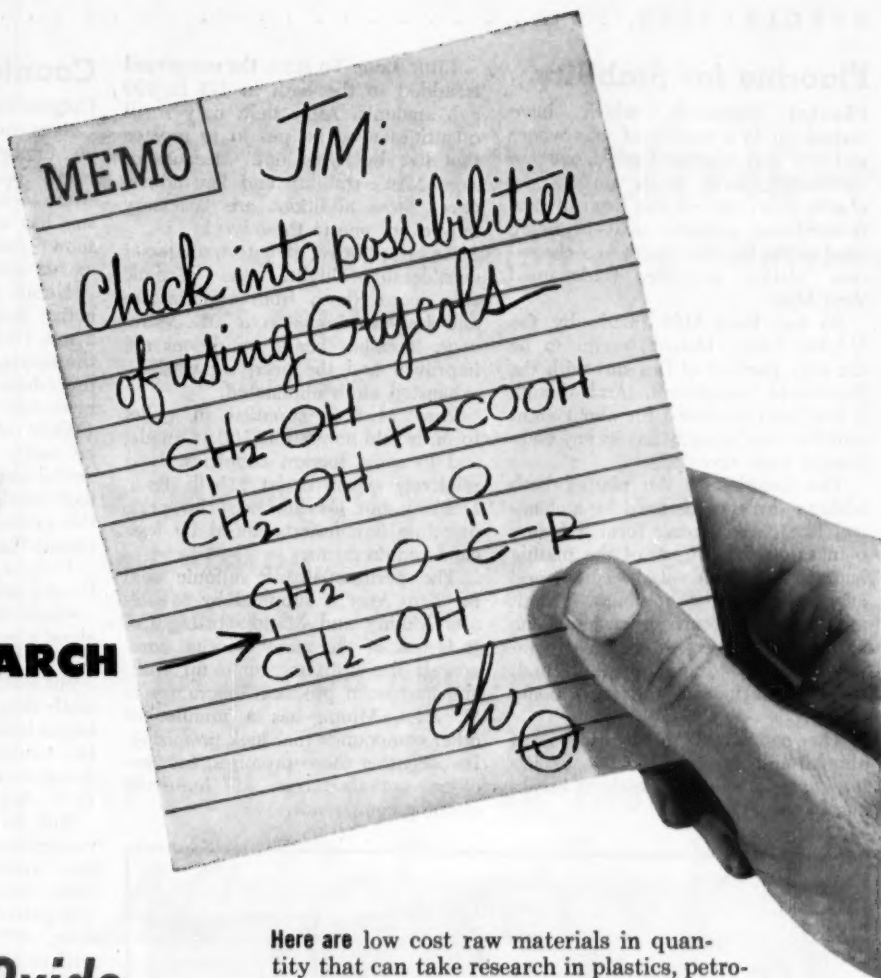


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## Fluorine for Stability

Fluorine chemicals, which have turned up in a variety of jobs where stability and chemical resistance are demanded, have taken on a new chore. Now, one—in the form of perfluoroalkane sulfonic acid—is being used as the key ingredient in a chromium plating additive, tradenamed Zero Mist.

So far, Zero Mist (made by the Udylyte Corp., Detroit) seems to be the only product of this sort with the fluoro-acid component. And though it has been marketed for about eight months, only recently has its key component been revealed.

The function of the plating bath additive explains the need for a chemical like PSA: it must form a foamy blanket on the surface of the plating bath to eliminate splash, spray, and evaporation of the hot bath. Too, it must reduce the surface tension of the bath so that there is virtually complete "run-off" (draining of the liquid) from the surface of the parts being plated.

The compound to do this must also be able to resist the hot, oxidizing chromic acid bath without breaking down.

**Little Loss:** To start, the compound is added to the bath in 1-3 lb/100 gal. amounts. After that, only small quantities need be put in to replace that lost by "drag out." Because of Zero Mist's stability and low adherence, these additions are necessary only every one to three weeks.

As an additive, it cuts bath losses considerably—Udylyte says chromic acid waste (both from vaporization and drag-out) is cut up to 70%. Moreover, it claims health conditions are improved and the need for washing exhausted air is eliminated.

Zero Mist is supplied in pellet form, is sold now in the U.S., Canada, and in some foreign countries. It is relatively expensive (at \$15/lb. f.o.b. Detroit), but Udylyte says this price premium is counterbalanced by lessened requirements.

The perfluoroalkane sulfonic acid for Zero Mist is supplied by Minnesota Mining and Manufacturing Co. It is one of the many fluorine compounds the firm has come up with, and its special products laboratory in St. Paul, Minn., has a number of other compounds that look promising. Investigating those promises, too, are other manufacturers of industrial cleaning compounds.

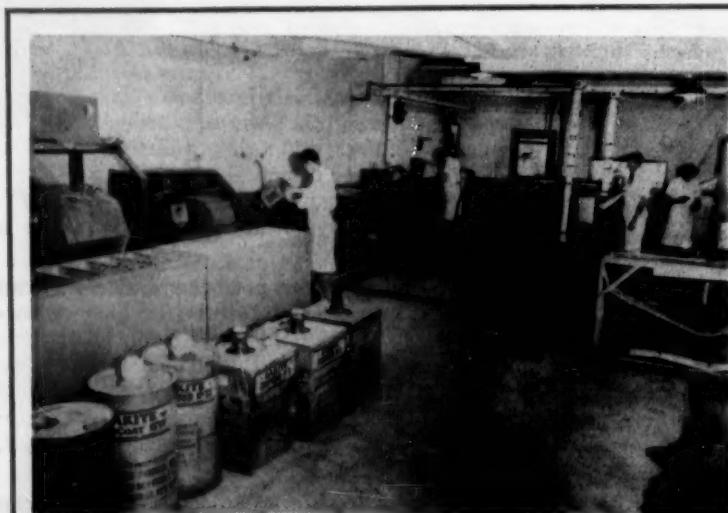
## Counter Clue

Colgate-Palmolive is putting the Geiger counter to work in researching on toothpaste effectiveness. At recently opened laboratories in New Brunswick, N.J., Colgate's Manno Nelson has come up with techniques to show just how long anti-enzyme agents are retained on the teeth.

Nelson's studies, made with radioactive forms of the Colgate anti-enzyme, Gardol, show that teeth retain the enzyme inhibitor for 48 hours. The procedure was to wash teeth, then immediately rinse them with water. (White rats, anesthetized so they could be easily handled, were given this dental care. Mascara brushes served as toothbrushes.) Indications are that the thin protein film (the so-called plaque) retains the anti-enzyme agent.

Colgate is particularly proud of its Gardol—sodium-N-lauroyl sarcosinate—which it introduced commercially about a year ago. Backed by actual use studies that showed the anti-enzyme agent materially aided in cutting down tooth decay in test subjects, Colgate began incorporating Gardol in its Ribbon toothpaste, a move that caused a major flurry among dentifrice makers (*CW*, Aug. 29, '53, p. 50).

Just last month Colgate-Palmolive was granted a patent on the use of certain types of anti-enzyme agents in tooth cleansers (U.S. Pat. 2,689,170). The patent was the work of William J. King, who had joined the Colgate staff in 1949 as a biochemist, and to whom Colgate credits the discovery of Gardol about a year later.



## New Ways to Clean

OPENING spanking-new laboratories last fortnight was Oakite Products, Inc. (New York). The firm has put 30,000 sq. ft. to use in hunting out new industrial cleaning compounds. Special feature of the new quarters is the wet room (above), part of the customer service division of Oakite. Actual plant

conditions are simulated in the area—equipment includes burnishing and finishing barrels, salt spray cabinets, still tanks, and five-stage washing machines. These facilities, plus the 10 other laboratories, triple the space Oakite can devote to product development and still leave room for future expansion.

## Pival Update

It's just as vital, when introducing a new rodenticide, to be certain that it's as safe for human beings and pets as it is deadly for rats. Hazleton Laboratories' (Falls Church, Va.) latest toxicity studies on Pival, given at last month's American Chemical Society meeting, lend extra assurance of the safety of the anticoagulant rat-killer, which is starting its heaviest push this fall.

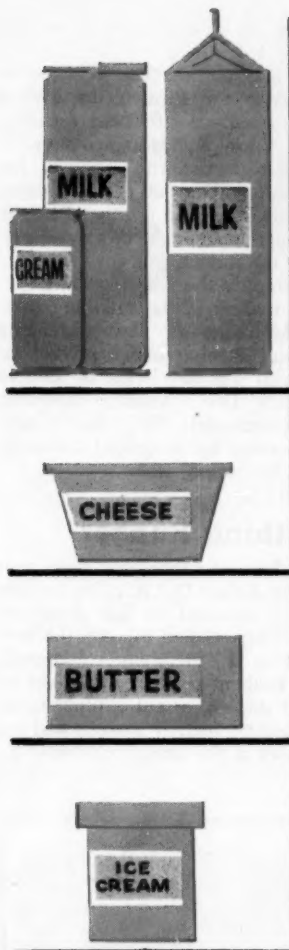
Two points of particular significance in the report:

- Of the antidotes for Pival (2-pivalyl-1,3-indandione, vitamin K<sub>1</sub> (Mephyton) appears to be most effective.

- Cats fed mice that had received lethal doses of Pival were not affected by the chemical (i.e., no secondary toxicity).

Before Pival was first introduced about two years ago (*CW*, Oct. 4, '52), there had been extensive toxi-





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## SPECIALTIES . . . . .

ecological tests, of course. But this is the first year of broad distribution of the rodenticide, and this new data should scout fears of users that their pets might be endangered.

Though Pival is still not as commonly used as the well-established Warfarin, it is expected to get pretty complete distribution in the East, South, Midwest and Canada this year. Among the firms selling rat poisons made with Pival: Colonial Chemical Co. (W. Palm Beach, Fla.); Douglas Chemical Co. (N. Kansas City, Mo.); Green Cross Products (Montreal); Dr. Hess and Clark, Inc. (Ashland, O.); and United Co-operatives (Alliance, O.).

**Deadly Drink:** Development of water-soluble rodenticides—pioneered by d-Con with Waricide—has been a major step in the effective utilization of ratkillers. Motomco is selling Pivalyn, a water-soluble sodium salt of Pival.

Prime selling point of Pivalyn, Motomco says, is its antifungal property—in water the solution doesn't become fouled with mould even if left standing for several weeks. This antifungal

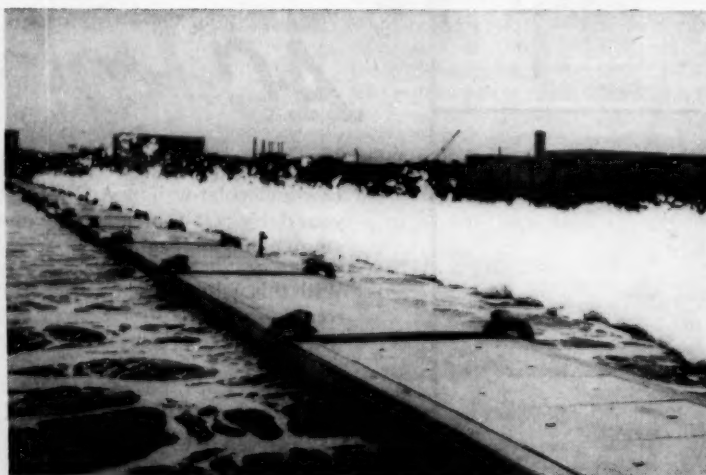
ability also permits use of sugar as the carrier for Pivalyn, to give a sweet, baited water that has a marked attraction for rats, Motomco says.

Another twist with Pivalyn has been the incorporation of a sequestering agent. It ties up the metal ions in hard water that might otherwise precipitate the rodenticide.

To simplify the job of putting specialties makers in the ratkilling business, Motomco is now packaging Pival and Pivalyn under private labels. Pival was developed by Kilgore Chemicals Div., Atlantic Research Corp. (Alexandria, Va.), and is now manufactured by Ringwood Chemical Corp. (Ringwood, Ill.).

## Breathing Rubber

A new form of rubber has been produced by Arthur D. Little, Inc., under a project financed by the American Viscose Corp. Called Filastic, the new product is a "breathing" (porous), elastic, resilient substance that can be sewn or stapled, or cut without causing a running tear. It is suggested for many uses of the sponge rubber—e.g.,

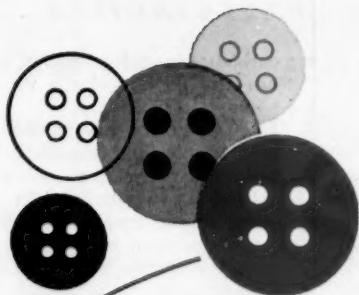


## Zeroing in on Foam Cause

DON'T LET the whitecaps fool you—it's a sewage disposal plant, not a storm-tossed ocean. Whether or not the cause of the excess foaming is a high concentration of synthetic detergents—as many believe—or something else, might be determined as the result of recent studies sponsored by the U.S. Public Health Service at New York University.

NYU sewage experts last week

demonstrated a simple means of titrating to ascertain the amount of syndet present in sewage water. Procedure makes use of hexane as an indicator—a prepared sample of the sewage water is titrated with a cationic compound (since most home syndets are anionic) until the hexane changes color. Proteins, calcium, and magnesium compounds don't interfere in the tests.



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**SIZE 14 JNM2 UNIVERSAL MIXER**

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for Auburn Button Works, Inc., Auburn, N.Y.**

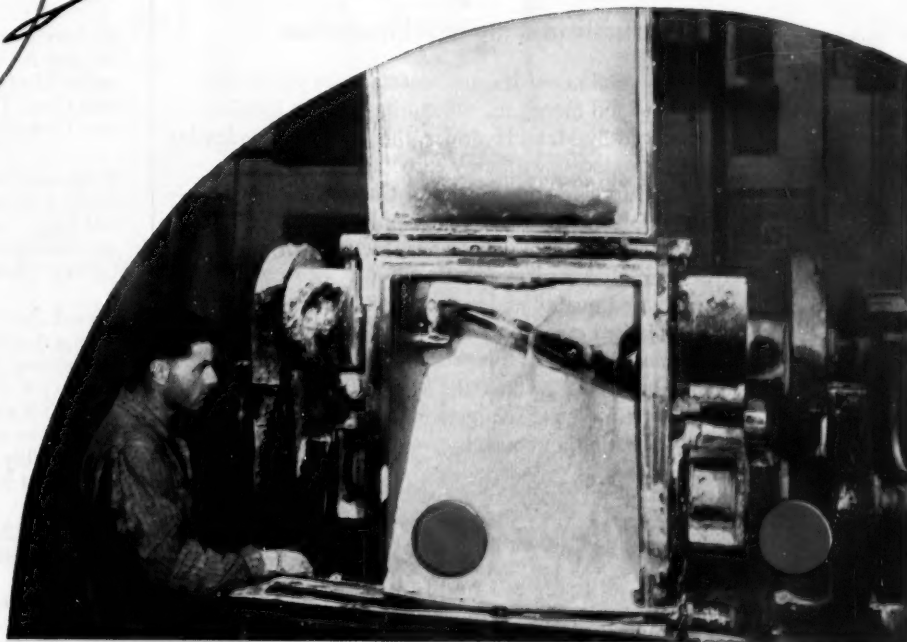
As an intermediate processor of raw materials for plastics fabricators, the Extrusion Division of Auburn Button Works in Auburn, New York, compounds and blends a wide variety of special vinyl plastic mixtures for its many customers. Thorough mixing and intensive kneading of the materials is necessary to insure a uniform blend with high tensile strength, good surface quality, retention of heat and light stability and other characteristics important in the finished extrusion. To obtain these characteristics, Auburn employs a specially designed Size 14 BAKER PERKINS JNM2 Universal Mixer with a working capacity of 50 gallons and a total capacity of 75 gallons. This machine is equipped with a trough shell of #304 stainless steel and is jacketed for 80 lbs. steam pressure. It has cast sigma blades with dispersion faces, cored for steam, and is driven by a 20 h.p., 900 rpm. motor.

BAKER PERKINS Universal Mixers are adaptable to virtually every mixing and kneading operation from very light to heavy duty, handling mixtures ranging in consistency from dry powders to stiff plastic masses. For complete information about Universal Mixers and other B-P equipment for the chemical processing industries, consult a BAKER PERKINS sales engineer or write us today.

289

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## SPECIALTIES . . . .

cushion innersoles, carpet pads—but can also go into elastic wearing apparel and rainwear.

Secret of the new rubber form is quite simple (and patented). The web is formed by milling rubber—either natural or synthetic—with conventional curing agents, then dissolving the composition in a volatile solvent, such as naphtha. The liquid rubber is then sprayed into a special chamber, where a fast-moving column of air breaks the rubber stream into fibers, carries it to the top of the chamber and deposits it on a moving screen. This layer is then talced and cured to form the tough, porous web.

**No Cold Fears:** In a pair of patents (2,683,699 and -700), Sherwin-Williams' Harvey T. Gehring shows one approach to making latex paints freeze-thaw stable. The paints use aromatic vinyl compounds with a conjugated diolefin and in one case, thiourea as a stabilizer.

**Bomb Pack:** Just introduced in the Midwest is the new aerosol form of Burma Shave. The brushless lather is packed in a 10-oz. Crown can, sells for 79¢. It's made by Burma Vita Co. (Minneapolis).

**Wire Jacket:** New electrical grade of vinyl resin has been marketed by Goodyear Tire & Rubber Co. Tagged Pliovic EDB90V, it is pure polyvinyl chloride resin, and is said to be the first of a series of resins for electrical applications—insulating wire and cable—that Goodyear has under development.

**Corker:** For adhering cork to glass, making it possible to fabricate decorative glass stoppers, Adhesive Products Corp. (New York) is pushing its new Cork-Grip.

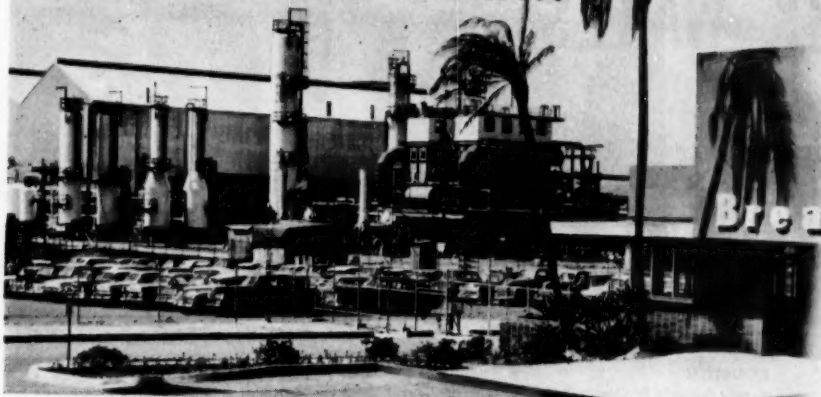
**Evaluator:** To keep check on its plant foods, International Minerals & Chemical Corp. has just opened a new laboratory at its East Point (near Atlanta) Georgia plant.

**New Lube:** Now containing molybdenum disulfide is the Goodenow Co.'s (Oklahoma City) specialty lubricant, Pylon Q-X. The new product is called Pylon Q-X with Moly. The new lube is claimed to remove sludge and lower the volatility of regular lube oil as well as to boost its lubricating qualities.

**Medicine Chest:** A pair of new forms of established drugs are on the market now:

• Diamox, a nonmercurial diuretic, has been marketed by the Lederle

Report from  
Brea Chemicals'  
New Ammonia Plant...



C. F. Braun & Co., Engineers and Constructors

...on their

*Air Products* Low-Temperature  
**LIQUID NITROGEN WASH UNITS**  
and Tonnage Oxygen-Nitrogen Generators

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JACK TIELROOY  
MANAGER OF DEVELOPMENT

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BREA CHEMICALS, INC.

*Jack Tielrooy*  
Jack Tielrooy,  
Manager of Development

AIR PRODUCTS built two of these "Package" hydrogen purification units using nitrogen wash and two oxygen-nitrogen producing units for Brea Chemicals, Inc., a subsidiary of Union Oil Company of California. "Package" Nitrogen Wash Units are available from Air Products with capacities to 10,000,000 cubic feet per day. Larger plants with greater capacities are also available. Both types are designed and built to meet individual requirements.

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Laboratories, division of American Cyanamid Co., in a form for intravenous use.

• **Surital Sodium**, an anesthetic of Parke, Davis & Co., is now available in a form for rectal use for children and adults.

• **Leaf Shredder**: A new liquid cotton defoliant, Tumbleaf-ML, is now marketed by the agricultural chemicals department of American Potash & Chemical Corp.'s Eston Chemical Div. Tumbleaf-ML contains no boron.

• **Key for Medley**: To produce resins specifically designed for the tropics, a new resin plant is being built by Key Chemicals Corp. on its new Medley, Fla. (outside Miami) site (CW, Sept. 4, p. 16). It will make use of raw material produced in the Southeast.

• **Lube Booster**: Rouge, the fine form of iron oxide used as a jewelers polish, has been added to break-in lubricants, with good results, University of Texas engineers have noted. Copper-lead and aluminum sleeve bearings are smoothed to the point where they have a 100% increase in load-carrying capacity.

• **Derusting Dip**: Alka-Deox 114, a non-electrolytic alkaline derusting compound, is now being sold by Enthone, Inc. (New Haven, Conn.). A powder used in concentrations of 1-3 lbs./gal. hot (180 F) water, it is claimed to strip off rust and organic coatings without damaging the base metal.

• **Soother**: A product for treatment of hypertension is Parke, Davis' new Serfin. The drug is a pure crystalline alkaloid (reserpine) of Rauwolfia serpentina, and is said to have a marked soothing effect on patients suffering from hypertension.

• **Sealer**: Aluminum powder pigment has been incorporated in the new calking and glazing compound, Alumilastic, made by Parr Paint & Color Co. (Cleveland). Developed to give a water- and moisture-tight seal for metal-to-metal and metal-to-wood, and to glaze all types of sash, it is said to "skin" within 48 hours, to set up a tough film in two weeks, and to be effective over a -40 to 180 F temperature range. It can be hand- or gun-applied.

• **Cane Wax**: In full-scale production now, and slated for end use in emulsion polishes, is Warwick Wax Co.'s Sugar Cane Wax 700. Priced at 65-70¢/lb., depending on quantity, it is available in carload quantity.

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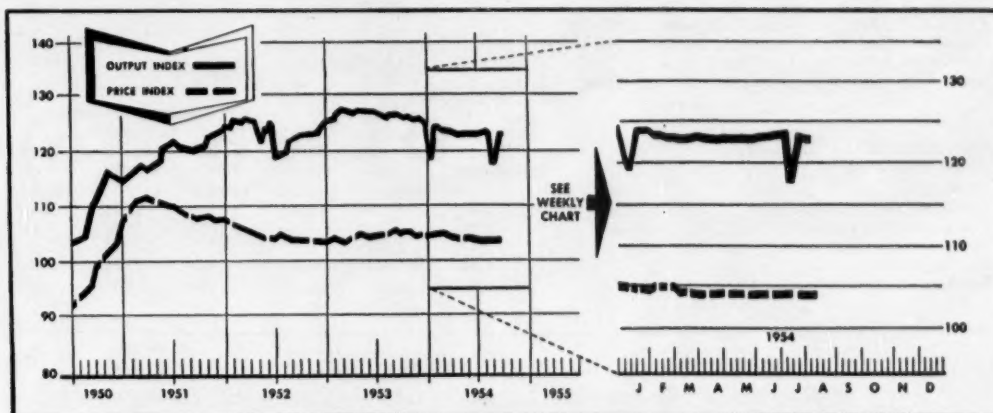
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# MARKETS . . . . .



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries  
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

## MARKET LETTER

Already market prognosticators are turning out tentative predictions concerning the growth outlook for 1955. One crystal-baller expects the upcoming year to be one of normal growth, hitting a level perhaps 4% above the so-called '54 readjustment line.

Of more immediate concern to some marketers, however, is the way rubber is—and has been—skidding. Last week B. F. Goodrich's president, W. S. Richardson, appraised the '54 picture, foresaw total U.S. rubber consumption at some 100,000 tons less than had been forecast earlier. The tally: estimate made last year on new rubber that would be consumed in '54, 1,315,000 long tons; current prediction after successive quarterly downward revisions: about 8% less, or 1,200,000 tons.

Estimates for crude rubber use, too, are slipping. Just a few months ago (April) the level for this year was pegged at 620,000 tons—but the anticipation was hedged with the proviso that crude rubber prices continued lower than GR-S. Crude, of course, has inched higher, resulting in a slashed estimate of the quantity likely to be used. New, but not very firm, probability is about 585,000 tons for the year.

There's a predicted switch in the rug field, too, pointing up the trend spotted two months ago (*CW*, Aug. 7, p. 77). When Roxbury Carpet (Saxonville, Mass.) takes over the Heritage Carpet Mills (Chattanooga, Tenn.), cotton tufted goods will be dropped from the line, emphasis will be laid on man-made fibers and wool.

Until now it's been practically standard practice that a carpet maker's move to the South would entail production of cotton tufted items.

It's more than a trend, this practice of oil companies' getting into the ammonia business. Just three months ago Atlantic Refining turned the valves on a new synthetic ammonia unit at its Philadelphia refinery, which should eventually hit a 100-ton/day output.

Last week two firms, Standard Oil of Indiana and Sinclair Refining, revealed that they would join forces to put up the country's largest—some 300 tons/day—anhydrous ammonia plant based on by-product hydrogen (*see p. 24*).

## MARKET LETTER

### WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	123.4	123.2	126.3
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.2	104.0	104.9
Bituminous Coal Production (daily average, 1,000 tons)	1,322.0	1,329.0	1,608.0
Steel Ingot Production (1,000 tons)	1,642.0 (est.)	1,637.0 (act.)	2,149.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	334.1	324.4	243.6

### MONTHLY INDICATORS—Trade (Million Dollars)

	Manufacturers' Sales			Manufacturers' Inventories		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	\$24,213	\$24,250	\$26,366	\$44,208	\$44,526	\$46,485
Chemicals and allied products	1,627	1,724	1,720	3,141	3,085	3,108
Paper and allied products	753	766	766	1,024	1,046	1,030
Petroleum and coal products	2,105	2,202	2,237	2,777	2,771	2,696
Textile products	1,040	1,064	1,181	2,389	2,422	2,666
Leather and products	367	355	328	580	595	568

Now trade talk has it that Sun Oil late next week will announce its entry into the ammonia arena. It's all part of Sun's active expansion into chemical production. There are no details concerning the extent of the company's similar hydrogen-based ammonia venture as yet, but chances are it will rival the Standard Oil-Sinclair plant in terms of output.

Prices continue to follow a haphazard path—some go up, others decline. On the advance—by 3¢/lb.—are two big magnesium salts, USP grades of magnesium carbonate and oxide. Behind the hikes: the drug trade's making ready for what promises to be a traditionally good fourth-quarter business.

But dominating the pharmaceutical market last week were some significant vitamin price slashes. Thiamine hydrochloride (B<sub>1</sub>) and ascorbic acid (C) are currently down about 23-25%. In the first changes since late Dec. '52, the former was cut to \$100/kilo (from a previous \$135), while the acid was reduced \$5/kilo to 25-kilo lot price of \$16.

The drastic reductions are the result of domestic makers' attempts to buck razor-keen competition from imports, but the feeling is strong in the field that a more effective solution of the problem of foreign undercutting lies in higher tariff walls.

While producers and sellers here hope no further price altering will be necessary, most are ready to wield the pencil again if the situation warrants it.

New, lower level of cobalt salts prices, too, is partly a manifestation of some telling import blows. Increasing quantities of foreign salts—at lower than domestic prices—have of late made broad inroads into a not-too-brisk market.

These competition-forced slashes—like those in the vitamin arena—may well presage further sniping at these typical current quotes: cobalt acetate, \$1.30/lb. (down 7¢); carbonate at \$2.15 (off 13¢/lb.); cobalt hydrate down 18¢/lb. to a new \$2.72. Other reductions range between 6¢ and 12¢/lb.

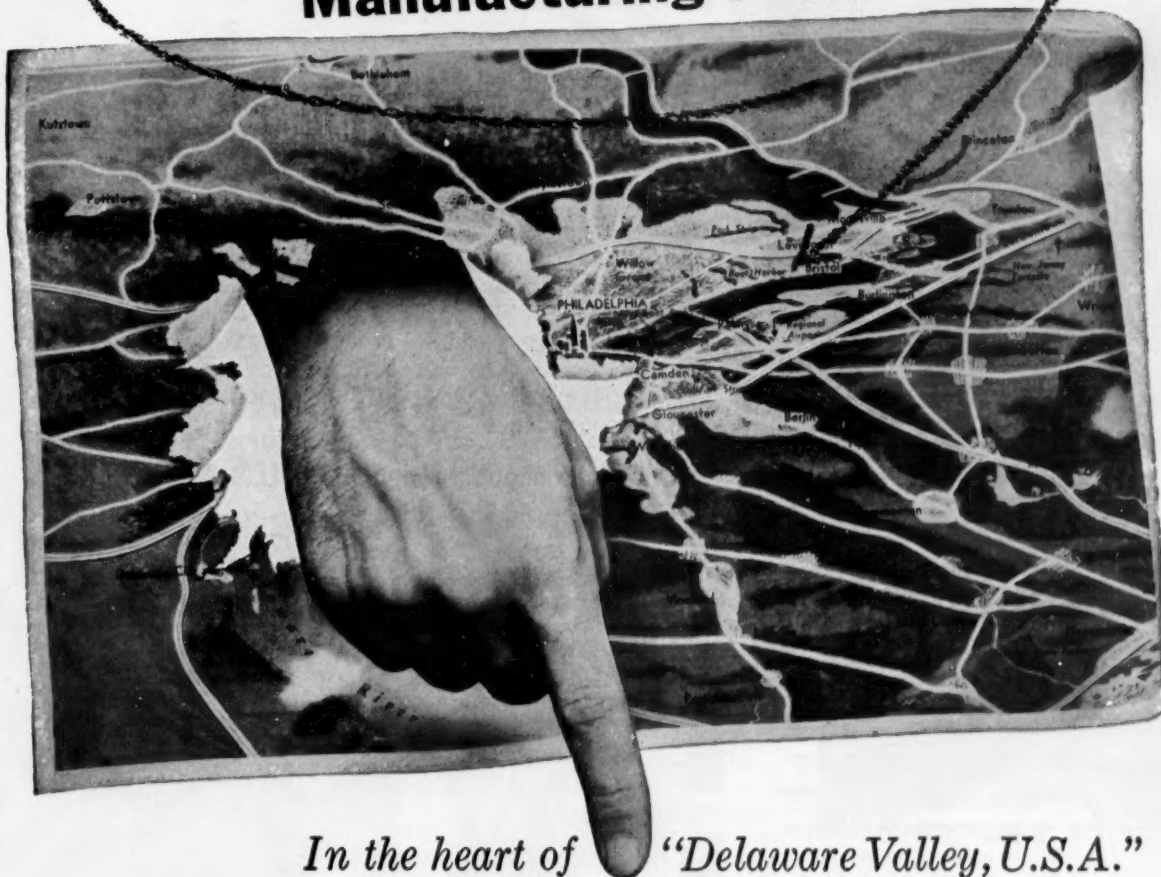
### SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending Sept. 27, 1954

DOWN					
	Change	New Price		Change	New Price
Ascorbic acid, USP dms., 25-50 kilo lots (kilo)	\$ 5.00	\$ 16.00	Sodium ascorbate, dms., 25-50 kilo lots (kilo)	\$ 5.00	\$ 16.00
Cobalt acetate, 27.3% Co, bbls., dlvd.	.07	1.30	Thiamine hydrochloride, USP, regular or ampul-type, fib. dms. (kilo)	35.00	100.00
Cobalt nitrate, 20.1% Co, bbls., dlvd.	.12	1.00			

All prices per pound unless quantity is stated.



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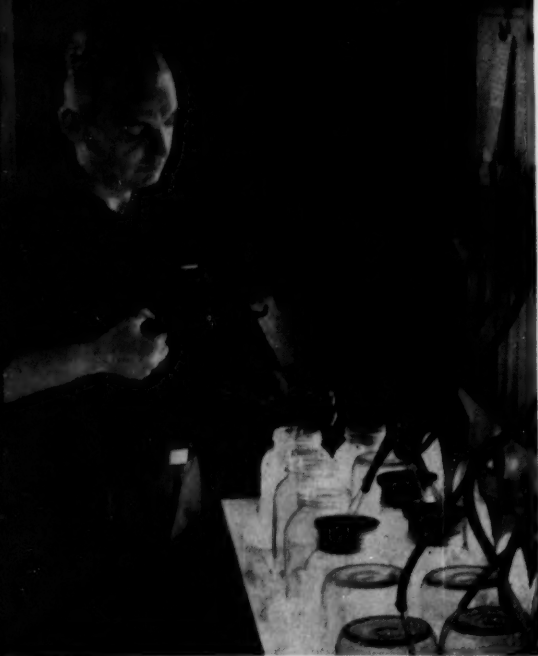


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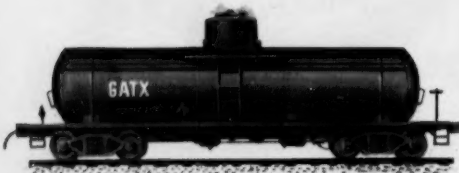


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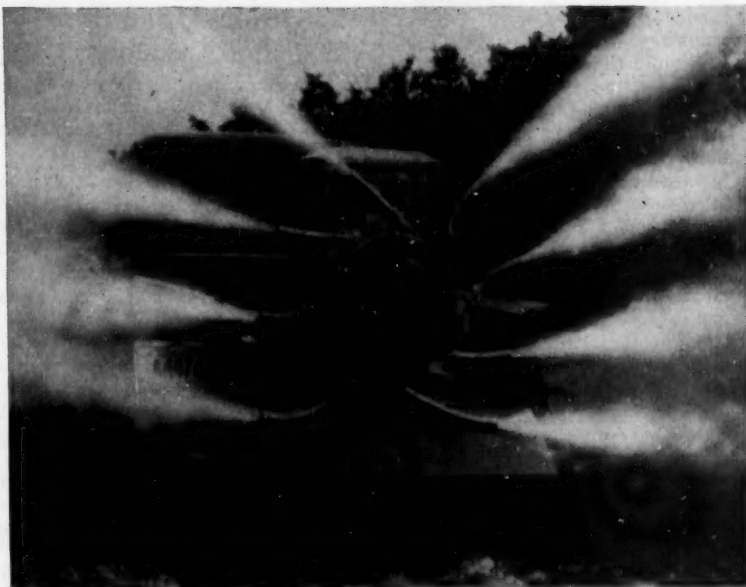
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## Pesticides Pace Emulsions

This week the new agricultural crop year\* gets under way. And interested segments of the chemical process industries are sizing up potential demand for their products. One such group, emulsifier makers, aren't too disheartened at prospects for the next 12-month outlook, estimate that farms will use a tidy 10 million lbs. of emulsifiers—these principally in the forms of emulsifiable concentrates† of insecticides and herbicides.

Some pesticide "experts," too, see eye to eye on the extent that such outlets will consume emulsifiers, peg the upcoming take at a similar 8-12 million lbs. That the field is growing, is further substantiated by a quick glance to the pounds-sold figure of just a few years ago. As recently as 1951 approximately 6 million lbs. of pesticide emulsifiers were dispersed—only slightly more than half the current expectations.

**Formulas Unending:** The emulsifier salesmen and technical servicemen are being bombarded by specifications for an unending list of formulations, because now through the first of the year is the traditional period for trying to work out more effective emulsifier-solvent-toxicant systems. But emulsifier manufacturers are dipping into a

relatively small raw material pot to meet all these demands. Actually, about 90% of these materials fall into five chemical groups: sorbitol and certain other polyols (especially glycols); ethylene oxide; long-chain phenols; fatty acids (principally oleic and stearic); and sulfonated oils.

It's the blending of emulsifier derivatives that yields the multiplicity of formulas. Up to about two years ago the sorbitol or phenoxy ethers and esters were more generally used than the others. Since then, development emphasis has stepped up the pesticidal use of nonionic-anionic surface-active fractions.

At the moment, blends of the sorbitol esters and ethers and of polyethoxy ethers and/or esters with sulfonated oils dominate a near-90% of the market. Running third in the group of emulsifier blends are the phenoxyethoxy ethers. (Trade opinion rates the latter as little more effective than several other cheaper combinations.)

It's well-nigh impossible to determine individual consumption data on the various emulsifying materials—trade data are closely held—but that there's a general emulsion upswing is indicated by the definite trend toward emulsifiable pesticide concentrates or "liquids."

In any size-up of toxicant emulsifiers, interest naturally fixes on the leading bulk organic pesticide, DDT. Usage of the old-time bug killer last

year tallied to some 84 million lbs., with emulsifiable concentrates making up about 25% of that amount. Almost half—roughly 40 million lbs. of DDT—is applied as wettable powders not employing emulsifiers, and the remaining quarter is spread annually as a dust. The latter, however, is gradually giving way to liquids.

**Dust Out:** That dusting is on the way out is also pointed up by the trend in herbicide application. A high percent of 26-28 million lbs. of 2,4-D currently consumed in the U.S. is in the form of emulsifiable concentrates. That's the preferred method, too, for dispersal of some 4-5 million lbs./year of 2,4,5-T. (Fact is, 2,4-D dusting is prohibited in this country, although it's still permitted in Canada. Some brush control usage gets along with an oil solvent, bypassing emulsification.)

Domestic consumption of toxaphene this year is slated to exceed the 30 million lbs. sold in 1953. If the same ratio holds true, a near-25 million lbs. will be applied in an emulsified form.

On the other hand, benzene hexachloride (BHC) requirement—which may rise close to the '51 peak year total of 11 million lbs.—continues to call for dusting as the chief spreading method. Probably 80% of the total BHC consumed will be used as dust, another 15% as wettable powder—leaving a little more than 0.5 million lbs. to be shared among emulsifiable concentrates.

Chlordane users last year bought only some 6 million lbs., but a high proportion—about 35-40%—was in liquids. Exact use figures on aldrin and dieldrin are not available, of course, but one trade estimate figures that 50-60% of the total sold is in the newer form.

**Supply/Demand:** Although there's no dearth of U.S. pesticide plants—an estimated 450 are in production—only a select few are turning out the concentrates. About half the total number have facilities only for blending dust, while the other 200 or so handle both dusts and liquids. Almost all, however, do some little amount of concentrate business, if only on a "tailor-made" basis.

Bulk of the ag chemical emulsifier output, however, is shared by three leading producers. Tops is Atlas Powder, which probably accounts for a good 30% of the country's total production. A close second, with perhaps a quarter of the market, is Emulsol Corp. Another 15% is turned out by Rohm & Haas.

In the formulating end of the business, it's a safe bet that not more than 60 formulators actually produce emul-

\* The crop year is from Oct. 1 to Sept. 30 of the following year; not to be confused with the fertilizer year, which runs from July 1 to June 30.

† Growing interest in these concentrates was underscored at a recent ACS meeting in New York when top-flight consultant Theodore Riedeburg cited the development and marketing of agricultural chemical emulsifiers.



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## MARKETS

sifiable concentrates in any substantial volume.

Despite the lack of statistics, most market followers tab the Southern states as holding the greater potential demand for the ag chemical emulsifiers. Reason: cotton's multiple infestations. But not to be shrugged off are other areas currently garnering emulsifier sellers' attention: the Northwest (pears and apple orchards); California (citrus fruits, grapes, cotton, vegetables); Midwest (forage crops, small grains, corn, fruit, etc.); Middle Atlantic (with potentially good increases in liquid applications to tobacco, tomato and peach crops); New York and the Northeast (potatoes, apples, truck and forage crops).

All this ties in with the fact that most of the toxicants used are oil-soluble—the reason pesticide manufacturers put up the emulsifier help-wanted sign. Dilution with water helps to cut customers' costs by making it possible to spread the toxicant around more economically.

Paradoxically, the bigger pesticides user isn't always the better emulsifier customer percentagewise. Here's why: the agriculturist who uses high-gallonage, water-diluted material wets the plant growth quite heavily, therefore orders a quick-breaking emulsifier in his toxicant-solvent-water system. With mechanical or hydraulic agitation of the emulsified concentrate, the mixture gives very little true emulsion. Result: sometimes as little as 1% of the formula need be emulsifier.

At the other extreme, the pesticide applicer who uses a low-volume sprayer with little agitation needs a concentrate with high initial flash and long creaming (separation) time. Back in the early '40's it was not unusual for such formulas to contain 10-15% emulsifier. Improvements in recent years, however, have slashed that requirement down to as little as 2½ to 7% by weight.

**Diversifying Dips:** Generally, crop infestations determine the market for insecticidal surface-active agents—one reason emulsifier makers follow closely the rise and fall of insect forages. With bugs literally at a premium the last couple of years, most producers have cast an eye on textile, food and cosmetic outlets at the same time pesticide formulation targets have been sighted, even though these other uses do not consume identical emulsifiers.

At any rate, pesticides alone this year should write a \$3-4 million sales ticket for emulsifiers—not yet the biggest dollar maker, but surging satisfactorily as a formulators' raw material.

## Organic Upswing

Chemical marketers and economists are by now studying the long-awaited annual U.S. Tariff Commission report on production and sales of synthetic organic chemicals in 1953.\*

The wide survey is painted in broad strokes, but highlighted is the 15.5% increase in production of all synthetic organic chemicals and their raw materials during 1953 as compared with the previous year—60,759 million lbs. vs 52,618 million.

As in the past, the figures represent totals of raw materials and semifinished and finished products, thus necessarily involve a great deal of duplication. But despite the overlapping, the data are comparable.

Some of the comparisons with 1952 totals have already appeared in piecemeal fashion: various subsections have preceded the annual summary over a period of the past few months. But in this 37th annual compilation the patchwork is sewn together for comparison and interpretation.

The bulk of the grand total—just about half—is accounted for by last year's 29,129-million-lb. output of synthetic organic chemicals, a climb of slightly more than 11% over that of '52. But the steepest rise—an impressive 41.7%—of any segment of the grand total between the two years was achieved by crude products from petroleum and natural gas, a jump from 7,867 million lbs. in '52 to 11,147 million lbs. in '53.

But sales of synthetic organic chemicals, in turn, showed a rise in '53 over '52 of only 8.7% (15,637 million lbs. over 14,384 million lbs.).

The miscellaneous category takes in the largest number of chemicals in the total synthetic organic figure. The '53 output of 17,669 million lbs. pulled ahead of '52's 15,893 million lbs. by just about the same percentage as did the grand total—11.2%. But again, sales in 1953, 7,804 million lbs., moved a little more slowly—some 7.1% above those of the previous year.

The largest category output total on the synthetic organic chemicals list (excluding the omnibus category of miscellaneous), the 4,699 million lbs. of cyclic intermediates was a 12.6% percentage increase over 1952. Sales of these intermediates, however, hit a better pace than synthetic organics as a group: 1,874 million lbs. in 1953, some 21.4% higher than those in the previous year.

By contrast, finished cyclic intermediates showed just the reverse per-

\* Based on information supplied by 608 companies. Abundance of the statistical fare involves some 6,000 individual chemicals. Manufacturers are listed.

centage trends: output ran from '52's 4,515 million lbs. to '53's 4,939 million lbs.—a 9.4% rise; whereas 1953 sales of 4,198 million lbs. edged up only 4.8% over those of the previous year.

Next largest slice of the synthetic production pie was taken by plastics and resin materials: last year's output of 2,777 million lbs. was a hefty 19% above that of '52. Their sales last year of 2,372 million lbs. spurted 16% ahead of those of the previous year.

Only two other individual groups of the synthetic organic column exceeded the plastics and resins percentage growth in 1953 over 1952: surface-active agents, and flavor and perfume materials. The 921-million-lb. production of surface-active agents in 1953 was a surprising leap of 24.3% over '52's output of 741 million lbs. Flavor and perfume material output, although considerably smaller—34 million lbs. in '53, made the substantial showing of a 22.1% increase over that of the preceding year.

Also in the range of better-than-5% but less-than-15% increase in production came plasticizers, dyes, rubber-processing chemicals, toners and lakes.

Group data on the downbeat side were few last year. Pesticides and other organic agricultural chemicals suffered the only significant output percentage decline. Last year's 356 million lbs. was a dip of 14.8% below 1952's output. Sales, though, were on the plus side: purchase orders went out for 334 million lbs. in 1953, compared with 331 million lbs. the year before.

Production of medicinals did take a very slight dip between the two years, but remained practically at a standstill rate of 67 million lbs.

**Tar Details:** A step removed from the synthetic organic chemicals output are the figures racked up for coal tar, water-gas tar, and oil-gas tar. Their grand total in 1953 was 901 million gal. compared with 793 gal. in 1952, an advance of 13.6%.

Of the tar crudes xylene made the best showing: gallonage-turnout ran from 71.7 million in '52 to 113.5 million last year, a solid 58.2% increase. However, sales upturn of this commodity were comparatively disappointing—a 13.5% rise from 57.8 million gal. to 65.6 million.

The next steepest percentage climb in the tar crude data is held by toluene. from 105.3-million gal. output in 1952, toluene enjoyed a plus-48% rise in both production and sales.

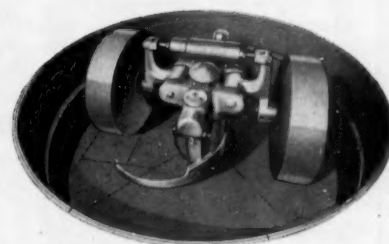
Trailing behind, however, was the production record for naphthalene. Gallonage slid down from '52's 322.5 million to last year's 275.8 million.

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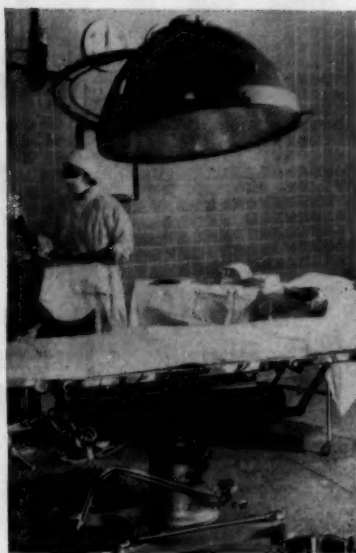
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## FEDERATED METALS DIVISION

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## MARKETS . . . . .



OPERATION OXIDE: Surgical goods and drugs undergo heatless sterilization.

## Cool Killer

Ethylene oxide as a sterilizer in the pharmaceutical and medicinal chemical field may be on the threshold of a healthy boom.

Known for at least two decades as a sterilizer and fumigant in the food and cigar tobacco industries, ethylene oxide is now adding new customers: antibiotics, packaged pharmaceuticals, surgical dressings, even disposable plastic syringes.

Convincing to many sterilizers are ethylene oxide's special advantages:

- It's a fairly inexpensive\* method of sterilization—possibly less costly than steam and certainly less than radiation by X rays, etc., depending on equipment available to the sterilizer.
- It doesn't damage antibiotics or the wrapping materials of packaged pharmaceuticals, as would steam.
- Unlike formaldehyde, it is easy to remove by diffusion from objects with which it has been in contact, and it leaves no odor.

Heading the list of the oxide's disadvantages, however, are these:

- It has an inhalation toxicity equal to that of ammonia gas, and aqueous solutions may act as a skin vesicant.
- It's explosive unless fairly well diluted with carbon dioxide (a typical commercial mixture known as Carboxide Fumigant contains 90% carbon dioxide, about 10% ethylene oxide).

\* Dr. David M. Ashkenaz, director of product development, Wyeth Laboratories, Philadelphia, calculates that ethylene oxide sterilization of 1 kg. of penicillin costs \$0.0415 for the gas, \$0.028 for labor, or a total of \$0.0695. The cost of equipment is approximately that of an autoclave.

• Materials to be sterilized must be fairly dry, otherwise ethylene glycol may be formed.

One expert who has watched this development closely says that the U.S. pharmaceutical industry has by now, within three years' time, increased its annual consumption of ethylene oxide to nearly that of the food industry. And the latter has been using this simplest of cyclic ethers for over 20 years.

There are, of course, basic patents controlling the ethylene oxide food sterilization process at certain temperatures. They're held by Dr. Lloyd Hall, technical director of Griffith Laboratories, Inc., Chicago. During World War II, Griffith operated on a seven-day-a-week, round-the-clock schedule, sterilizing spices, flavors, cereals, cocoa and sugar for the U.S. Army.

Also about that time Abbott Laboratories, North Chicago, and Wyeth Laboratories, Philadelphia, were sterilizing penicillin shipments for the armed services.

Griffith now has three licensees in the spices and seasonings business. But all of them do work for outside companies requiring sterilization, e.g., cocoa used by pharmaceutical houses, talc, face powder, some flour.

Lately Griffith has been sterilizing at its West Coast plant some plastic syringes for Zoller Chemical Co.

There's no lid on potential markets for bacteria-destroying ethylene oxide. Besides the already mentioned uses, there's a host of applications wherever the effects of heat (as from steam) or radiation vitiate some desirable qualities of the product.

Take, for example, the need for reducing without heat the bacteria count in confectionery and related products; flour, cereal and rice; bakery products; dried and dehydrated fruits and vegetables.

Peanut shellers and peanut oil mills, malt bins, cotton gin and cotton seed mills may also be attracted to the epoxide in minimizing product spoilage by bacteria. Makers of animal feeds, too, could likely profit from similar ethylene oxide lowering of the bacteria count.

Sales advantages are often built on appealing to the public's desire for sanitary products. The sanitary aspect is a likely clue to a sizable future application of ethylene oxide in sterilizing mattresses, pillows and down, furs, and such personal products as toothbrushes and razor blades.

With this potential use of heatless sterilization, marketers of ethylene oxide foresee business in the hundreds of thousands of pounds in a widening array of industries.



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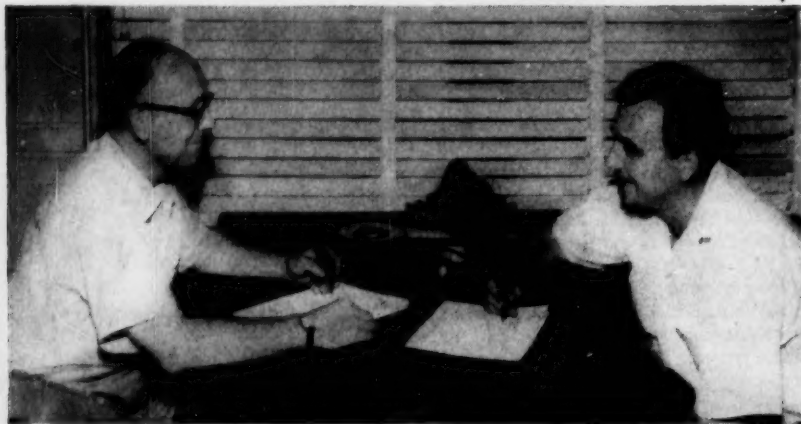
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DUGGAN AND DUNLAP oversee operation of Carbide's process safety dept. ↓



AN IMPORTANT FACET of the department's work is the fire research lab headed up by Durbin Way (left) shown talking to his right-hand man, Herbert Cobbs.



LAB has facilities for determining explosive limits of liquids.



IN FULL-SCALE explosion test, Cobbs observes temperature inside container to be blown up...



... switches to periscope trained on site as Way...

## PRODUCTION...

### Getting the Drop

One of the country's leading exponents of constructive destruction is Carbide and Carbon's James Duggan. As head of the firm's process safety department, his job is to see that Carbide's Charleston, W. Va., plant is as secure as possible from fires and explosions.

When it comes to testing on a small scale first, Duggan never misses a bet. At the same time, he's a firm believer in knowing-by-doing. Says he: "You can't pilot plant a fire, for you have to presume ideal conditions on a small scale. Disasters just don't occur under ideal conditions."

As a result, he and his staff start test fires like an army of arsonists; they've set off enough pilot explosions to move a county. But this penchant for constructive destruction has paid off.

Since 1945, for instance, Carbide has cut its fire losses drastically. But that's only a part of the story. "Our big job," Duggan says, "is to boost the continuity of production." That also happens to be the most difficult phase of the work to measure.

More tangible results can be seen in reduced insurance rates. Duggan, however, feels that the days when

## on Disaster

a protection program can be justified in terms of lowered insurance premiums alone are fast disappearing. He feels that's only a minor facet of the work. As he puts it: "Protection is security; insurance is merely indemnity."

There's a popular argument to the effect that only a few companies can afford an all-out effort like Carbide's. As Duggan sees it, the truth is that nobody can afford not to have such a program. This is how he argues:

Even a token effort costs money—for equipment and for salaries for professional fire fighters. In a more thorough program, periodic inspection and repair help to pay the way by paring the maintenance bills. He also points out that the time spent by his own department amounts to only 1.58% of the time put in by the entire plant force.

**In Three Parts:** The idea for the process safety department hit Carbide management in 1934. At that time, it was pioneering commercial production of a whole family of synthetic organics that were never before handled

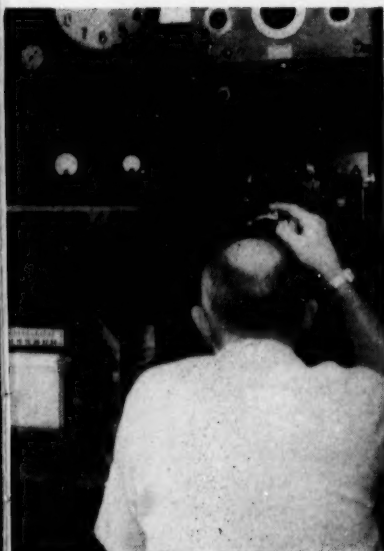


**NERVE CENTER OF** protection division is at Central Emergency Station where all alarms are channeled, fighting efforts coordinated.

on a large scale. Wondering whether it was paying enough attention to fire prevention, it called in Duggan

(who was then in the maintenance department).

At first, his job was to detect



... enters, observes apparatus for measuring pressure in container.



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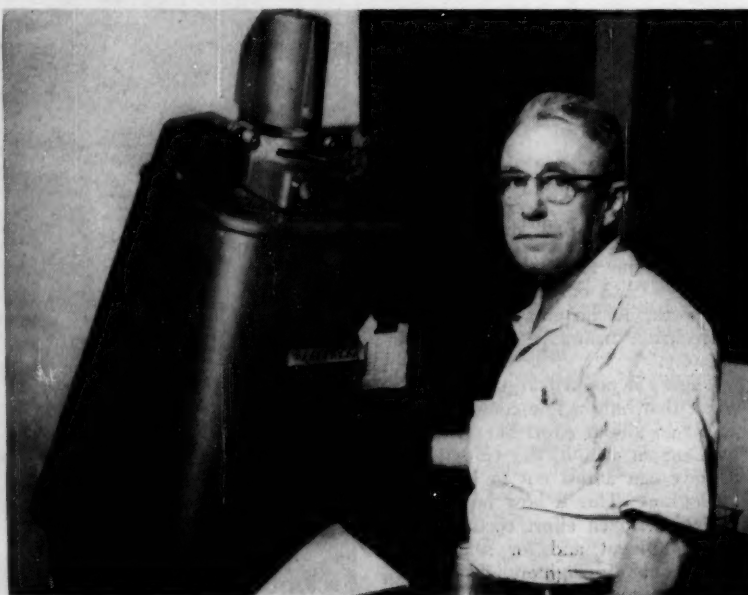
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## PRODUCTION . . . . .



LIKE A GOOD DOCTOR, R. F. Huling keeps a complete medical history of all his patients—approximately 75,000 pieces of process equipment.

potential sources of mechanical failure in the equipment. That soon led to other aspects of fire prevention, eventually to fire fighting as well. Today, the department is broken down along functional lines into three divisions, all working under Duggan and his second-in-command, Art Dunlap: test and inspection, the fire research laboratory and fire protection.

Under Reed Huling, the test and inspection division works a lot like the commercial airlines in their preventive maintenance programs. It keeps records on some 75,000 pieces of equipment, has a complete history on each item—when it was installed and when and why it's been repaired.

The division can predict within surprisingly close limits when a certain piece is likely to fail. It can, in short, call its shots. As a result, mechanical failures are few and far between. Last year, there were only 12 major\* failures on equipment, 82 minor ones. Although there were 547 minor failures on machinery, there were only 6 major ones.

In terms of time and effort expended test and inspection accounts for the bulk of work done by the department. Time spent by it, in fact, amounts to 49.2% of the time spent by the department. Most of the work is routine (last year, it tested and serviced 23,526 safety valves, 28,257 pressure gauges).

\*A major failure is one that causes the shut-down of any operation for any length of time. A minor failure is one that can be remedied without shutting down.



INSPECTOR-FOREMAN O'Neil pulls a card on an ailing charge.

The fire research laboratory is headed up by Durbin Way. Basically, it has two functions:

- To determine the stability and explosibility of plant products and intermediates. It pinpoints safe plant operating procedures, can, for example, find out in an oxidation reaction whether it's advisable to use higher pressures or more oxygen. It also sees that equipment design is safe, checks shipping containers of hazardous chemicals to determine whether the safeguards are adequate.

- To proof-test fire-fighting and

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## PRODUCTION . . . .

fire-protection equipment to ascertain its suitability for use in a chemical plant. Under this heading is the work that led to the introduction of Carbide's Unox fire-fighting foam (CW, May 22, p. 44).

In the fire research lab is a unique system that measures the temperature and pressure rise of explosions (*see cuts, pp. 98-99*). By means of a strain gauge the pressure is translated to an electrical impulse, which registers on a screen. Then, by comparing it with a calibrated curve, the engineers can find out not only the maximum pressure attained but also the rate of pressure rise.

In the same lab, Duggan and his staff have apparatus to measure the flammability limits of liquids as well as equipment to test the efficiency of fire-fighting equipment and techniques.

The fire protection division is charged with the responsibility of putting out fires once they're under way. But all the actual fire fighting is done by "amateurs." Although there are professional fire fighters in the department, their job is to evacuate the workers and to train the operators in the fire-fighting techniques.

Duggan earnestly believes that the men who operate the equipment every day, since they know it best and are the ones on the spot when a fire breaks out, are the logical ones to extinguish it.

Out of a total working force of 6,140 at one of the company's plants, 3,075 employees have received fire-fighting training. Fire hydrants (with an adjacent shelter for hose) are spotted every 200 ft. throughout the plant. The truck at the Central Station answers alarms, carries six men for rescue work. It also carries hose (as an added precaution) and enough equipment to outfit 35 men with rain-coats, gloves, gas masks and other items of protective clothing needed to combat fires in chemical plants.

**Built-In Protection:** Duggan feels the process safety department has made some big strides. But he admits it has a long way to go. "The ultimate," he says, "is to put fire protection in the plant at the design stage—protection belongs on the drawing boards. We're approaching that now. Industry in general has amassed a lot of knowledge about its products. But we've got to put that knowledge to work by devising means to keep the materials harmless. Most important, we've got to consider human frailties in designing our plants, for we have to build them so that man can't upset them."





## Dependable Source for Chemical Raw Materials



*R. J. Suess, left, President and General Manager, Otsego Falls Paper Mills, Inc., Otsego, Mich., and R. C. Beveridge, Purchasing Agent and Production Manager, discuss merits of northern hardwoods.*

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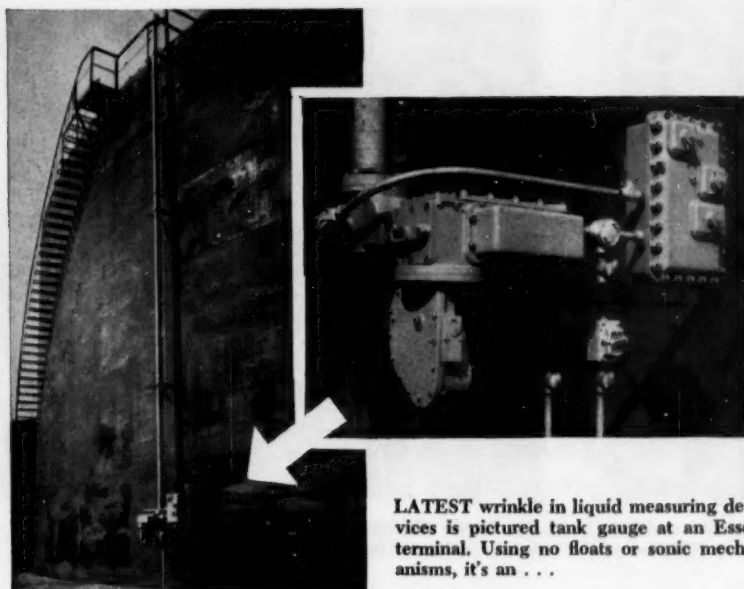
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LATEST wrinkle in liquid measuring devices is pictured tank gauge at an Esso terminal. Using no floats or sonic mechanisms, it's an . . .

## Electronic Detective

It's getting so that few measuring jobs in the process industry are safe from electronics. The latest one to fall is the old problem of measuring liquid levels in storage tanks: Gilbert & Barker Mfg. Co. (West Springfield, Mass.) has just placed a new electronic tank gauge on the market.

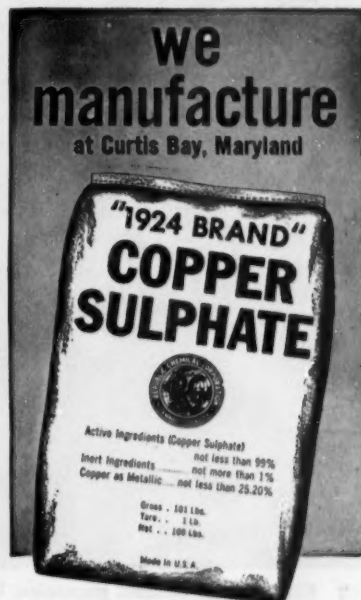
It's not that there aren't plenty of instruments that will do the same job; Gilbert & Barker simply felt that there was room for a more accurate one. Its new instrument, it says, can give you the level of a liquid in a tank within

$\frac{1}{8}$  in., and it works independently of temperature or viscosity.

The gauge is actuated by electronic signals that operate a servo-motor, which, in turn, raises or lowers a sensing element as the liquid level moves. Some feel that the electronic instrument is a complicated one for doing a relatively simple job and that any increase in accuracy will not be worth the corresponding hike in cost. In any case, it's sure to get a thorough evaluation by chemical men as well as refiners.



OPERATOR monitors 17 levels on remote null-balance receiver.



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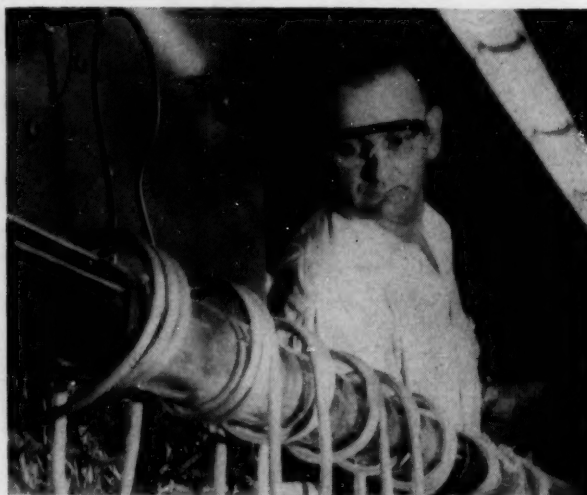
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**1** CHEMICALLY PURE germanium bars are removed from hydrogen reducing furnace at GE's Clyde, N.Y., works.



**2** ZONE REFINING, also carried on at Clyde, reduces impurities in the germanium bar to parts per billion.

## Chemicals Smash the Vacuum Tube

Six months ago some segments of industry were already talking about germanium rectifiers and transistors in the past tense (*CW*, March 20, '54, p. 97). The difficulties of drawing the thin wafers seemingly doomed them to become merely historical footnotes in explaining development of the more promising silicon stereotrons.\* But last week, General Electric presented for public viewing a mass-

\* Recently coined by the trade, the word refers to solid electronic components, derives from the combination of electronics and the Greek stereos, meaning solid or solid body.

production process that promises to elevate germanium at least to chapter heading in future texts.

At the moment, GE is tooling its Electronics Park works (Syracuse, N.Y.) for mass production (in the millions) of the germanium units, expects to begin wide-scale sampling late this year, production (limited only by sales) sometime next year. The process, says the company, should peg germanium transistors at prices competitive with vacuum tubes.

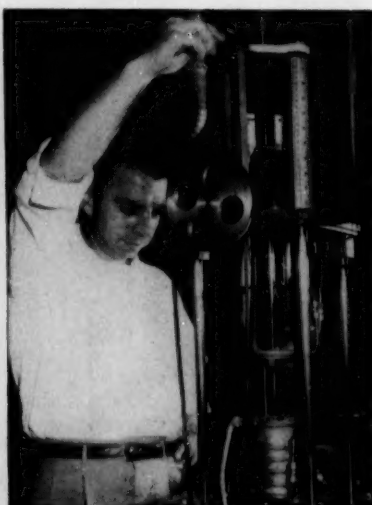
**Mass Miniaturization:** Meanwhile,

pilot runs (in the hundreds) are finding military applications, are undergoing several engineering, design and military evaluations. The pilot operation, an outgrowth of the rate-grown process revealed last year, produces the transistor elements during the actual refining of individual ingots.

From each 6-in. germanium ingot, more than 2,000 transistor bars are formed, attached with leads, and thereby converted into transistors. A quarter-pound of germanium is required for every 2,000 transistor bars;



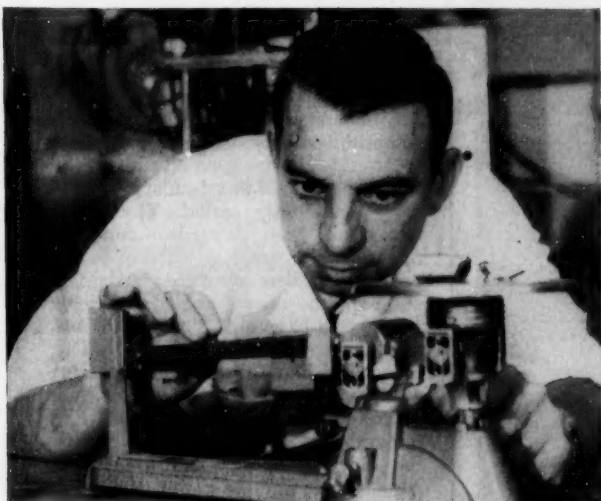
**5** GERMANIUM, gallium, and antimony are fed into rate-growing furnace.



**6** SINGLE-CRYSTAL germanium seed is lowered into furnace.



**7** DESIGN ENGINEER keeps close tab on crystal growth.



**3** TRANSISTOR formation starts at GE's Syracuse, N.Y., plant as worker weighs out 0.25 lb. of pure germanium.



**4** MICROSCOPIC quantities of gallium and antimony are weighed, will modify transistor's electrical properties.

in light of General Electric's proposed (several million/year) production of the bars, it should consume several hundred pounds of germanium a year.

**Diced Dividends:** In present (as well as planned) operations, transformation of powdered germanium dioxide into pure germanium takes place at the company's Clyde, N.Y., plant. The dioxide is reduced in a hydrogen furnace, converted into bars of chemically pure germanium that are further purified by zone refining. (Final impurities are measured in parts per billion.)

Operations then swing to the Electronics Park plant where pure germanium is weighed out in quarter-pound

lots, etched with hydrofluoric and nitric acids to remove surface impurities such as oxides, and placed in a crystal-growing furnace.

Microscopic quantities of gallium and antimony, weighed on an analytical balance, are added, a glass hood is lowered over the crucible and the furnace purged with argon. The argon is replaced by forming gas (4% hydrogen, 96% nitrogen) and the furnace is run in this atmosphere while the ingot is being drawn.

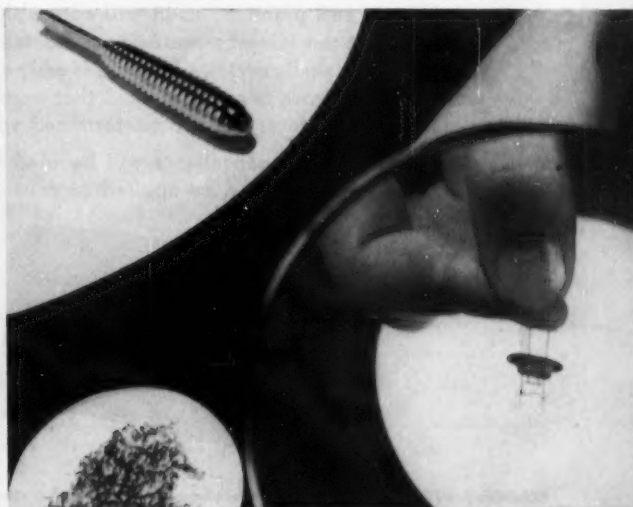
At approximately 950 C, the mixture melts and the drawing is begun. A "seed" (a piece of single-crystalline germanium) is then lowered into the melt. The seed is revolved and slowly

withdrawn. The melt freezes to it, building up an ingot of the same crystalline structure. As the temperature of the furnace is varied, the rate of "growth," or freezing of the melt, varies. This "cycling" of the growth rate causes the concentration of antimony in the freezing material to vary while the concentration of the gallium remains practically constant. A remarkable feature of the process, says GE, is that transistor bars having optimum operating characteristics can be obtained at will, thousands at a time.

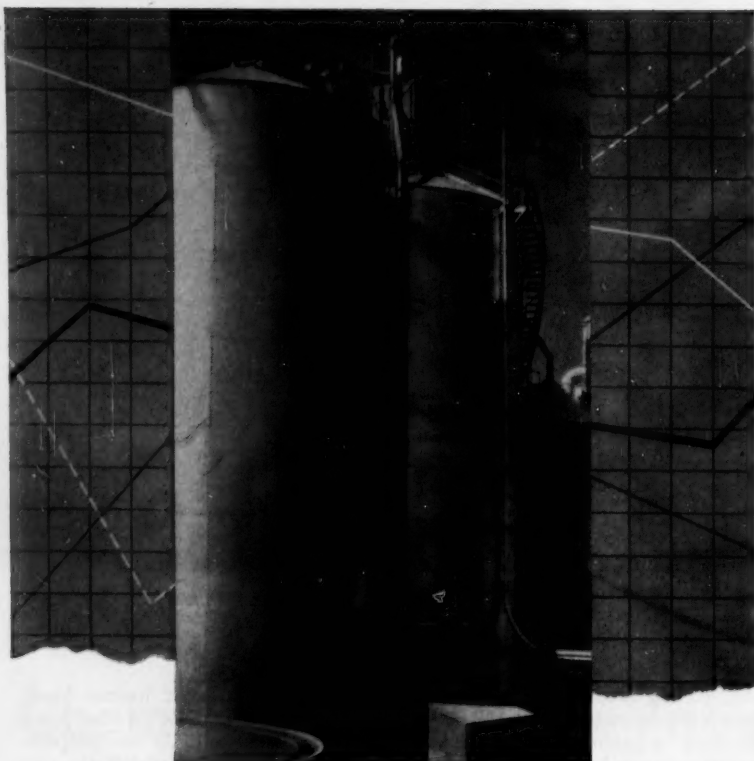
After the ingot is drawn, it is split lengthwise; the center section is tested for proper electrical characteristics of



**8** FINISHED rate-grown ingot weighs in at 0.25 lb., provides enough germanium to produce 2,000 transistors.



**9** FABRICATION of individual transistors takes place as ingot is diced into tiny bars, attached with leads (right).



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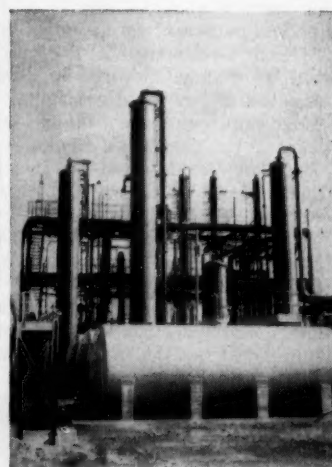
## PRODUCTION . . . .

the wafer-thin layers. If these are in order, the ingot is diced into transistor bars 0.02-in.x0.02-in.x0.1-in., each with its own "grid" section. The bars are then etched to ease out surface impurities and rough edges.

After lead wires are attached, the bars are fastened in a header, capped and hermetically sealed. The transistors are then painted, numbered and ready for use.

**High Hurdles:** More than a simple scale-up, the operation had to overcome some basic obstacles. Doping of the germanium melt with the exact amount of impurities, for example, is a fairly delicate operation. Too large or too small a concentration of the impurities in the melt adversely affects the current, voltage and frequency handling capabilities of the device.

Finding the right type of "impurities" also was no mean problem. And, at best, drawing the germanium ingots is still a ticklish operation. But of



### Plus Four

ABUILDING for more than a year, Solvay Process Div., Allied Chemical & Dye Corp., has completed construction of its chloromethane plant at Moundsville, W. Va. The plant, onstream this week, will add carbon tetrachloride, chloroform, methyl chloride and methylene chloride to Solvay's product line.

At present, the plant is using a direct chlorination process based on methane; but, suggests Solvay, it would be entirely feasible in this unit to operate on some other hydrocarbon raw material.





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## PRODUCTION . . . .

greater significance at the moment, says GE, is the void in circuitry design. It will take time for industry to develop circuits employing the new units; and though GE is still seeking to improve some aspects of its process, this design gap appears to be the last hurdle confronting commercialization.

Applications, declare General Electric, are waiting: the complete transistorization of radio and television receivers is now practical. Transistors lend themselves to the miniaturization of all types of electronic equipment. To the process industries, the boon could be smaller and less costly controls; and not far afield, it could mean low-cost availability of germanium power rectifiers for those interested in safe, efficient, low-voltage electrochemical operations.

## Atomic Aid

Build-up of atomic energy boosted the demand for fluorine (needed in the stepped-up uranium 235 separation program), backed chemical engineers against a wall buttressed by short-lived fluorine cells. At the American Chemical Society national meeting last fortnight in New York, Union Carbide and Carbon Corp., operator of uranium separation plants for the AEC, told listeners at the Fluorine Symposium how its engineers broke through the barrier, developed a superior cell.

It produces fluorine at lower cost, in less operating time, at a higher rate. Moreover, says UCC, it has twice the life span of previously available units. Incorporated in a 36-cell unit, operated electrically in series at 8 to 10 volts and 3,500 to 4,000 amperes without interruption until breakdown, the new fluorine cells would produce 2 tons/day, run at about 90% current efficiency.

Behind this improved operation is payment of careful attention to anode-to-cathode spacing and alignment and selection of anodes, use of electrolyte with less than 0.1% impurities, hydrogen fluoride with less than 0.05% moisture, and an electrolyte preconditioned with fluorine.

Fewer but wider anodes are used to obtain additional effective anode area; additional center cooling tubes and a baffled water jacket are also incorporated in each cell. Too, cell construction is improved by use of a stress-relieved nickel-base alloy inner shell, by alteration of the head to a single unit with multiple gas outlets and welded Monel skirts.

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## PRODUCTION . . . .

anode current densities—up to 125 amp./sq. ft.

Gaseous hydrogen fluoride is fed continuously to the cell; its concentration in the electrolyte maintained at 41-42% by weight. Electrolyte is held between 200-220 F and at a level 2-3 in. above the gas separation skirt. Cooling water inlet temperature is 140 F; outlet temperature is 160 F; and flow rate is 10 gpm.

Cooling of the cathode has increased the coefficient of heat transfer two to three times, says Carbide, while changing cell size has upped the effective anode area 30%. Half-day shutdowns are made only about once a month to replace faulty equipment and to clean headers, mist separators and pump piping.

By simplifying maintenance work through improved design, Carbide hopes to lower fluorine costs even more.

## EQUIPMENT . . . .

Portable Conveyor: A portable two-screw conveyor has been developed by Delta Tank Manufacturing Co., Inc. (Baton Rouge, La.) for handling granular products in bulk form. Dubbed the Delta Ba-zooka, the two-wheeled unit is powered by a self-starting two-cylinder engine, can be quickly positioned, and requires no setup action. A short cross screw feeds a hydraulically controlled elevating screw, which is adjustable to heights ranging from 6 to 16 ft., and says the firm is capable of handling up to 60 tons/hour of granular products.

Cycle Control: An automatic "brain" that will control any electrical machine operating through a cycle and any given cycle from beginning to end is being offered by Johnson Fare Box Co. (Chicago). The operational cycle can be set as required, for example, from two seconds to two weeks; and, says the manufacturer, in the event of any interruption, the normal cycle is completed and the machine shuts off. Suggested applications: sequential production operation; timed quantity measurements in processing liquids and solids.

Automatic Adder: For feeding wet-end additives to pulp-paper systems, Nopco Chemical Co.'s Paper Chemicals Div. (Harrison, N.J.) is marketing the Acumeter Synchronous Flow System developed by Acumeter Laboratories, Inc. (Newton Lower Falls, Mass.). The flow system, claims Nopco, provides accurately measured automatic feeding of all types of additives.

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for latest methods and equipment if you:

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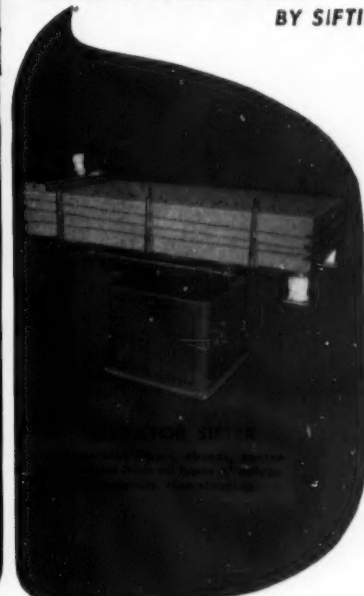
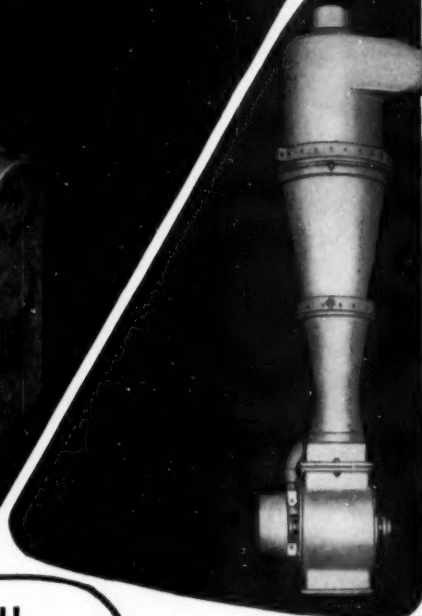
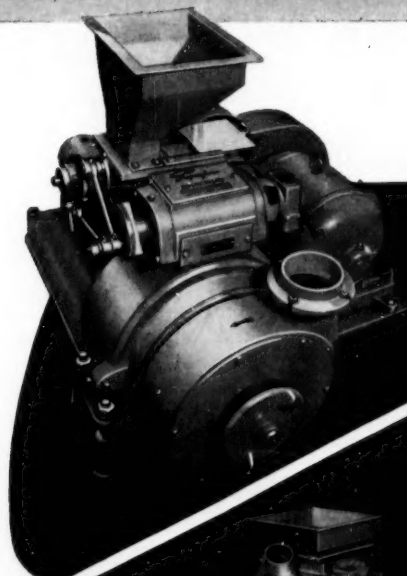
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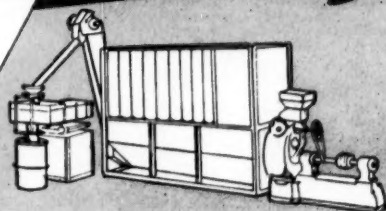
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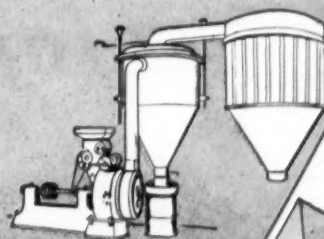


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Engineering Service for Mill Plans



MILL PLAN 45—Mill, Horizontal Tubular Dust Collector, Elevator, Gyrator Sifter.

Illustrated here are two from a large variety of Mill Plans, suggesting efficient operating set-ups for any material or plant layout. If you will advise us of your requirements, Schutz-O'Neill Engineers will recommend a suitable mill plan and equipment for your own use.



MILL PLAN 30—Mill, Cyclone Collector, Tubular Dust Collector.

Write for circular and name of SCHUTZ-O'NEILL Sales Engineer nearest you.

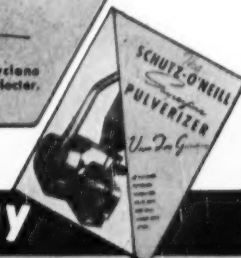
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**SERVICE AND**  
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(HEYDEN)

A solid polymer of formaldehyde characterized by an extremely low water content, high assay, low reactivity, low solubility, and high melting point. Useful in syntheses requiring formaldehyde, which are prevented or inhibited by traces of water.

**CONTAINERS**

**Superfyde® Powder**

Fiber drums, 250, 100, 50, 25 lbs.

**PARAFORMALDEHYDE**

(HEYDEN)

A solid source of formaldehyde, for manufacturing synthetic resins and as a catalyst for cold-setting adhesives. Also used in fungicides, deodorizers, and photographic chemicals.

**CONTAINERS**

**Paraformaldehyde U.S.P. X**

(Powder, Medium Powder, Flo-Granular)

Fiber drums, 250, 50, 25 lbs.

**HEXAMETHYLENETETRAMINE**

(HEYDEN)

Valuable to the synthetic resins industry in the curing of resins. Used as a chemical intermediate and as a hardening agent for casein, glue and other proteins; as a rubber accelerator; for explosives; for fuel tablets; in medicinals. As an amine, it finds use as a neutralizing or deactivating agent.

**CONTAINERS**

**Hexamethylenetetramine Technical**

Granular . . . Multiwall paper bags, 75 lbs.; Fiber drums, 100 lbs.

Powder . . . Multiwall paper bags, 50 lbs.; Fiber drums, 100 lbs.

**Hexamethylenetetramine U.S.P.**

(Methenamine U.S.P. Powder or Granular)

Fiber Drums, 100, 50 and 25 lbs.

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Widely used in the production of phenolic, urea, melamine and resorcinol resins; for converting casein, glue and other proteins into plastic products. Increasingly important in manufacture of chemicals and fertilizers. Used in embalming fluids, disinfectants, fumigants, deodorants, and in the leather, fur, paper and textile industries.

**CONTAINERS**

**Formaldehyde Solution N.F.**

Tank car . . . . . 72,000 lbs.

Tank truck . . . . . 30,000 lbs.

Drums . . . . . 475; 125; 90 lbs.

Carboys . . . . . 100 lbs.

**37% Formaldehyde—Methanol Free**

Tank cars . . . . . 72,000 lbs.

Tank trucks . . . . . 30,000 lbs.



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